

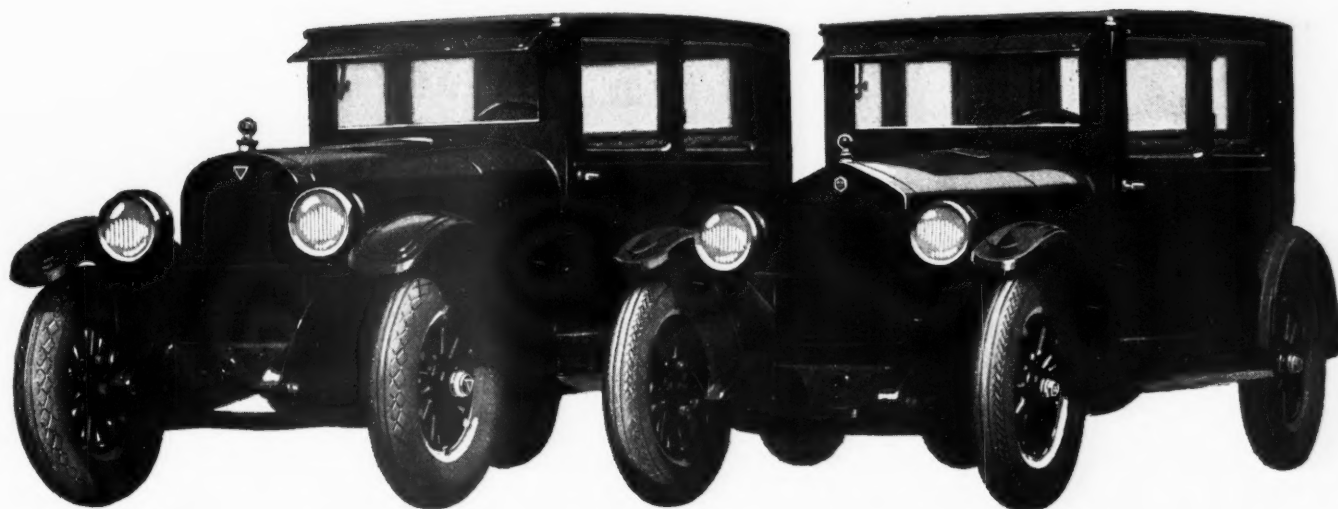
In This Issue—*How Display Helps Sell*

# MOTOR AGE

Vol. XLVI  
Number 25

PUBLISHED WEEKLY AT 5 SOUTH WABASH AVENUE  
CHICAGO, DECEMBER 18, 1924

Thirty-five Cents a Copy  
Three Dollars a Year



## “World’s Greatest Values”

*Enhanced by Sensational New Prices*

Always priced far below any closed car of comparable quality, the Coach is now reduced to a sensational new low price. It is the greatest value Hudson-Essex ever produced.

Largest production of 6-cylinder closed cars in the world makes possible these price reductions.

Everyone knows the Coach represents highest closed car value. No car at or near the price rivals it in actual proof of value—which is SALES.

and \$355 Less for the  
**World’s Greatest Sedan Values**

HUDSON Super-Six 5-Passenger SEDAN—\$1795

HUDSON Super-Six 7-Passenger SEDAN—\$1895

*Freight and Tax Extra*

These are the finest Hudson Super-Six Sedans ever built and may be justly considered among the finest and most luxurious cars in the market. At the higher prices the Sedans were the outstanding values of this field. Now at the new low prices they are SEDAN VALUES UNEQUALLED. They are offered

in line with Hudson’s policy of giving the world’s greatest values in closed cars.

Advantages of economical manufacture that no other builder approaches make these values absolutely exclusive to Hudson-Essex position as the world’s largest builders of 6-cylinder closed cars.

**HUDSON**

Super-Six Coach

**\$1345**

**ESSEX**

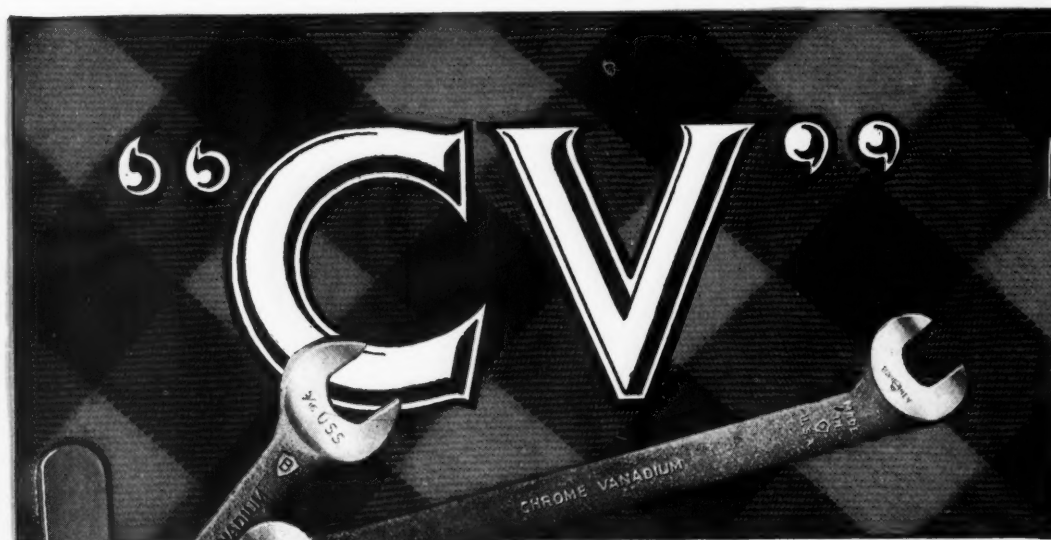
Six Coach

**\$895**

*Freight and Tax Extra*

**Business Is Good With HUDSON and ESSEX**

**HUDSON MOTOR CAR COMPANY, DETROIT, MICHIGAN**



#### Engineer's Wrenches

Guaranteed to strip the thread of any U. S. S. or S. A. E. nut or break the bolt before the jaws will spread. Sold in sets or individually.



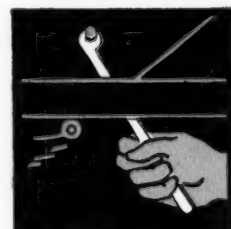
#### Tappet Wrenches

Very thin and long—and surprisingly strong—as every good tappet wrench should be. Made in all needed sizes.



#### Water Pump Packing Nut Wrenches

Only a wrench made of Chrome Vanadium could be made so thin, with such wide jaws and yet be so strong. Made for all cars and practically all trucks.



#### Special Service Wrenches

Especially designed for production and service work. Supplied in various sizes in 6 in., 9 in. and 12 in. lengths. Chrome Vanadium gives these wrenches the strength to stand the leverage which the extremely long handles provide.

## Bonney Aids To Service Men

**Super-Wrenches, made of Chrome Vanadium!**

The use of *Chrome Vanadium* instead of carbon steel insures ample strength to resist unusual abuse and permits light weight and fine proportions that mean perfect balance in a wrench.

Furthermore, needed styles and types of wrenches, heretofore impossible to build of carbon steel are entirely practical when forged of *Chrome Vanadium*.

\*"CV" Wrenches represent a 10 year advance in wrench forging.

Write today for catalogue No. 24. It gives full particulars on the entire line of Bonney \*"CV" Wrenches.

Made in U. S. A.

**BONNEY FORGE & TOOL WORKS**  
Allentown, Pa.

Also makers of Carbon Steel Drop Forged Wrenches, Stillson Wrenches, Vises, Pliers and Drop Forgings.

All these  
\*"CV"  
Wrenches  
are shown  
ONE HALF  
ACTUAL  
SIZE

\*"CV" is a  
Bonney  
Trade Mark  
Registered in  
the U. S.  
Patent Office

**BONNEY**  
*Chrome* **CV** *Vanadium*  
**WRENCHES**



# DOMINANT LEADERSHIP

**I**N the motor-wise markets of America where buyers know real automobile value, MOON has attained dominant leadership . . . This is not hear-say. It is *fact*, proven by official new car registrations from representative automobile markets.

-- **in Chicago**, Moon increased its sales 187% over the previous banner year.

-- **in California**, Moon jumped from 29th to tenth place in one year. First 6 months' sales 114% ahead of same period last year.

-- **in Rhode Island**, Moon ranked 17th

in 1923; today it is in 11th place. (59% increase in September over September 1923.)

-- **in Minneapolis**, in October, only nine companies registered more cars than Moon.

-- **EVERYWHERE**, Moon sales for 1924 are running far ahead of 1923.

## 3 things sell automobiles

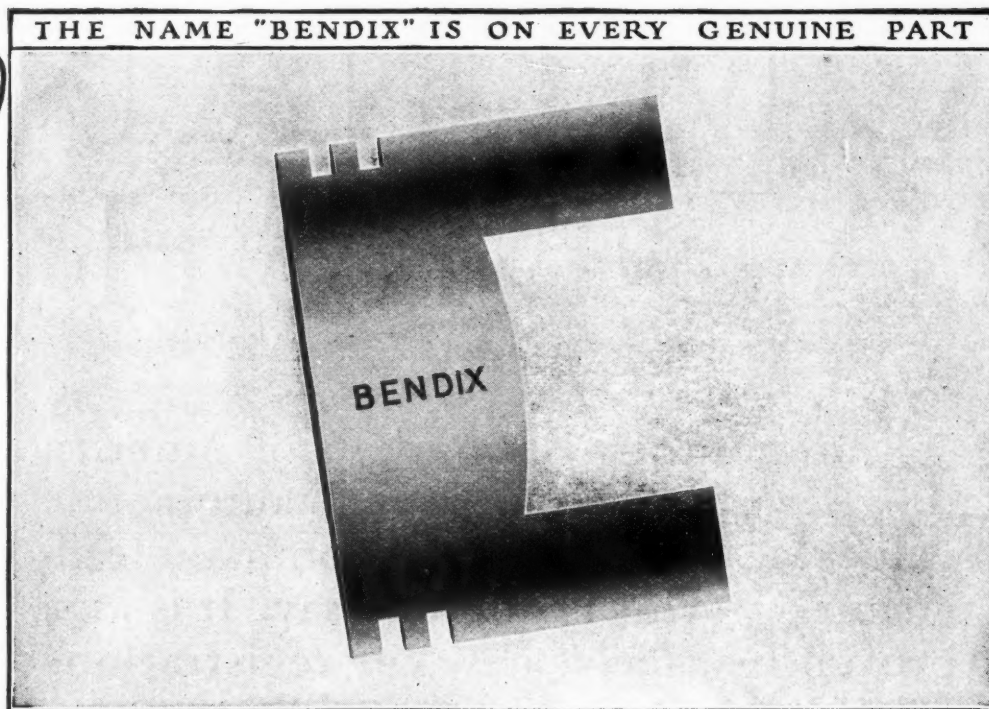
1. Looks; attractive body lines; beautiful finish.
2. Performance; power; speed; low upkeep.
3. A modern contract for the dealer.

**MOON**  
has all three - - and more

MOON MOTOR CAR COMPANY . . . ST. LOUIS

---

THE NAME "BENDIX" IS ON EVERY GENUINE PART



(Patent Pending)

**CAUTION:** In our Bendix Drive advertisements, appearing regularly each month in *The Saturday Evening Post* and *The Literary Digest*, the public is being cautioned to buy none but genuine parts and to look for the name "Bendix" on each part.

## The Bendix Service Sleeve

*(Installed Without Special Tools)*

A hammer and a blunt chisel are the only tools required to do the work quickly and easily. Three sizes give service on all models

See Chilton "Yellow" Directory for Bendix Service Data

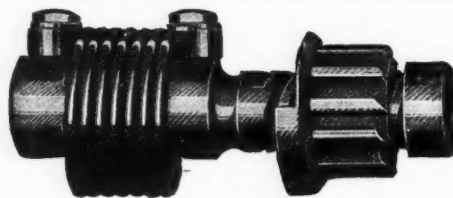
It pays to sell none but  
**GENUINE PARTS**  
 FOR  
**BENDIX**  
**DRIVE**

At the New York Show  
 January 2-10  
 Space 88

At the Chicago Show  
 January 23-31  
 Space 141

**ECLIPSE MACHINE CO., ELMIRA, NEW YORK**

*Eclipse Machine Company, Ltd. - Walkerville, Ontario*



# MOTOR AGE

Reg. U. S. Pat. Office

Vol. XLVI.

No. 25

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 CLARENCE PHILLIPS, Chicago News Rep.  
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Subscriptions accepted only from the Automotive Trade  
 Entered as Second Class Matter Sept. 19, 1899, at the Post Office  
 at Chicago, Ill., under Act of March 6, 1879.

"WITH the excellent product your company is building coupled up with the exceptional advertising campaign and dealers' helps for moving the merchandise, we believe that the Goodrich line is the most profitable for any dealer to handle."

## HIGHWAY AUTO COMPANY

Miles City, Montana

BUILD WITH GOODRICH  
 for PERMANENCY

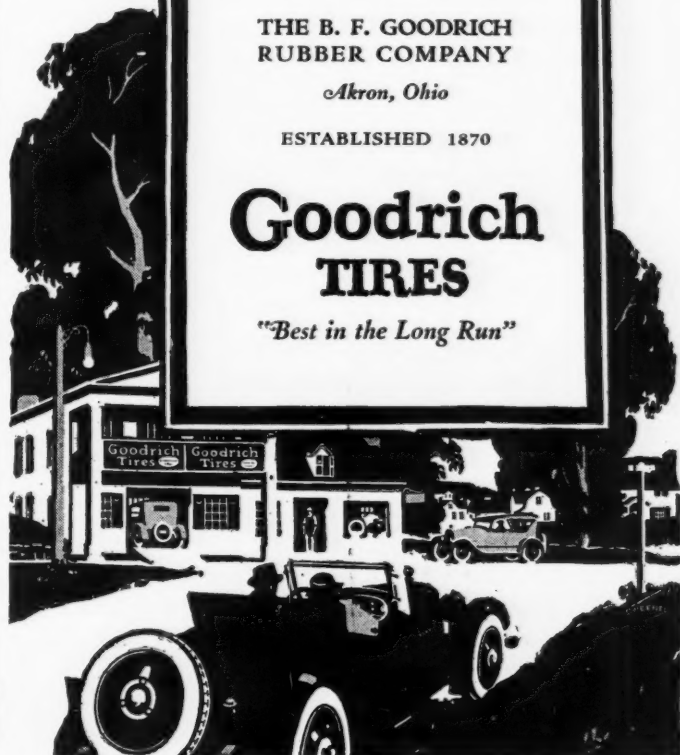
THE B. F. GOODRICH  
 RUBBER COMPANY

Akron, Ohio

ESTABLISHED 1870

# Goodrich TIRES

"Best in the Long Run"





## Closed Car Top Protection Assured

A sturdy, travel-proof and weather-proof Deck Covering is a necessary part of every closed motor car.

To obtain such a service-rendering material—remarkably durable and in keeping with fine closed car appointments—specify America's pre-eminent material

### CHASE DREDNAUT Deck Covering

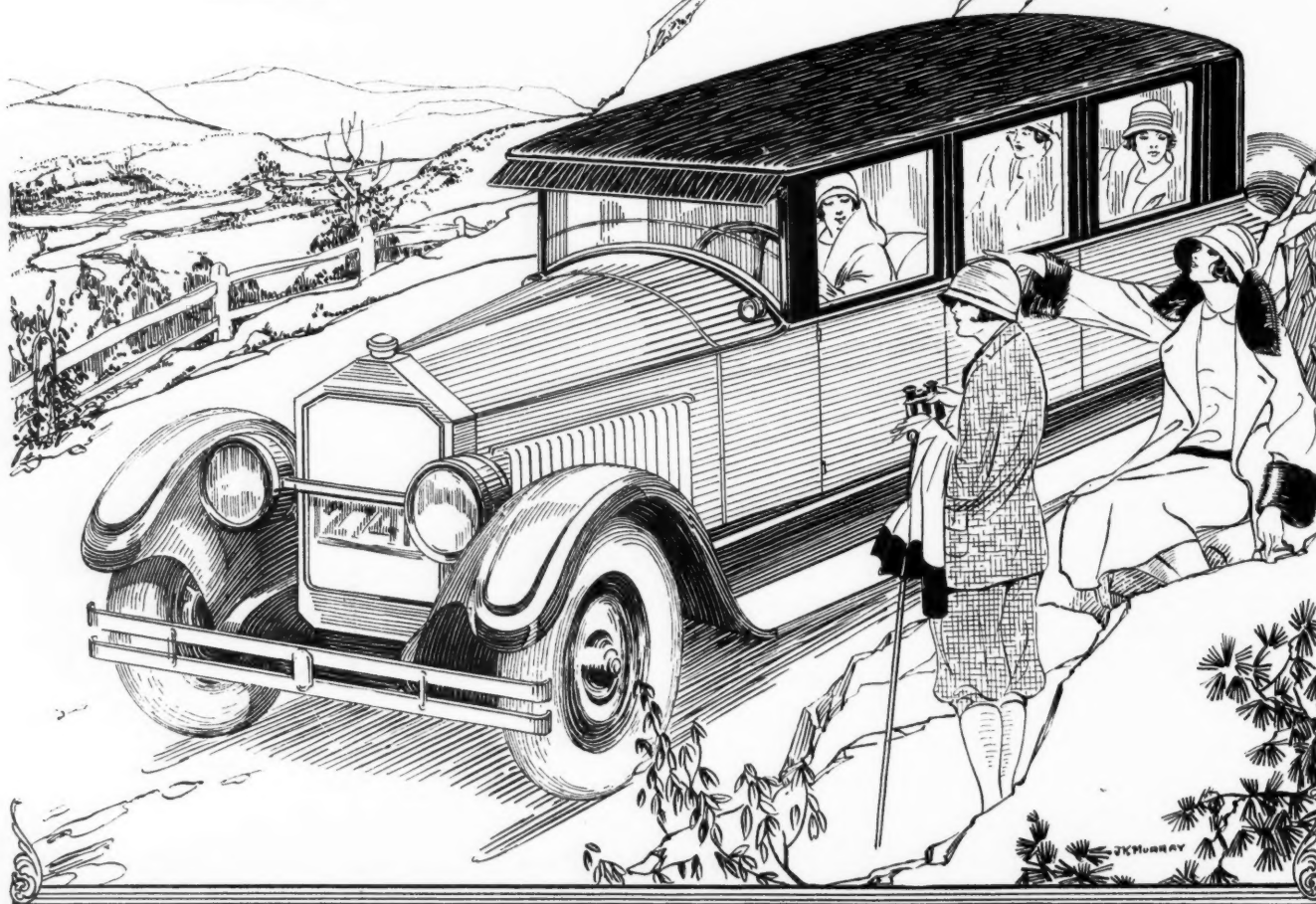
"DEFIES TIME AND THE ELEMENTS"

L. C. CHASE & CO., Boston

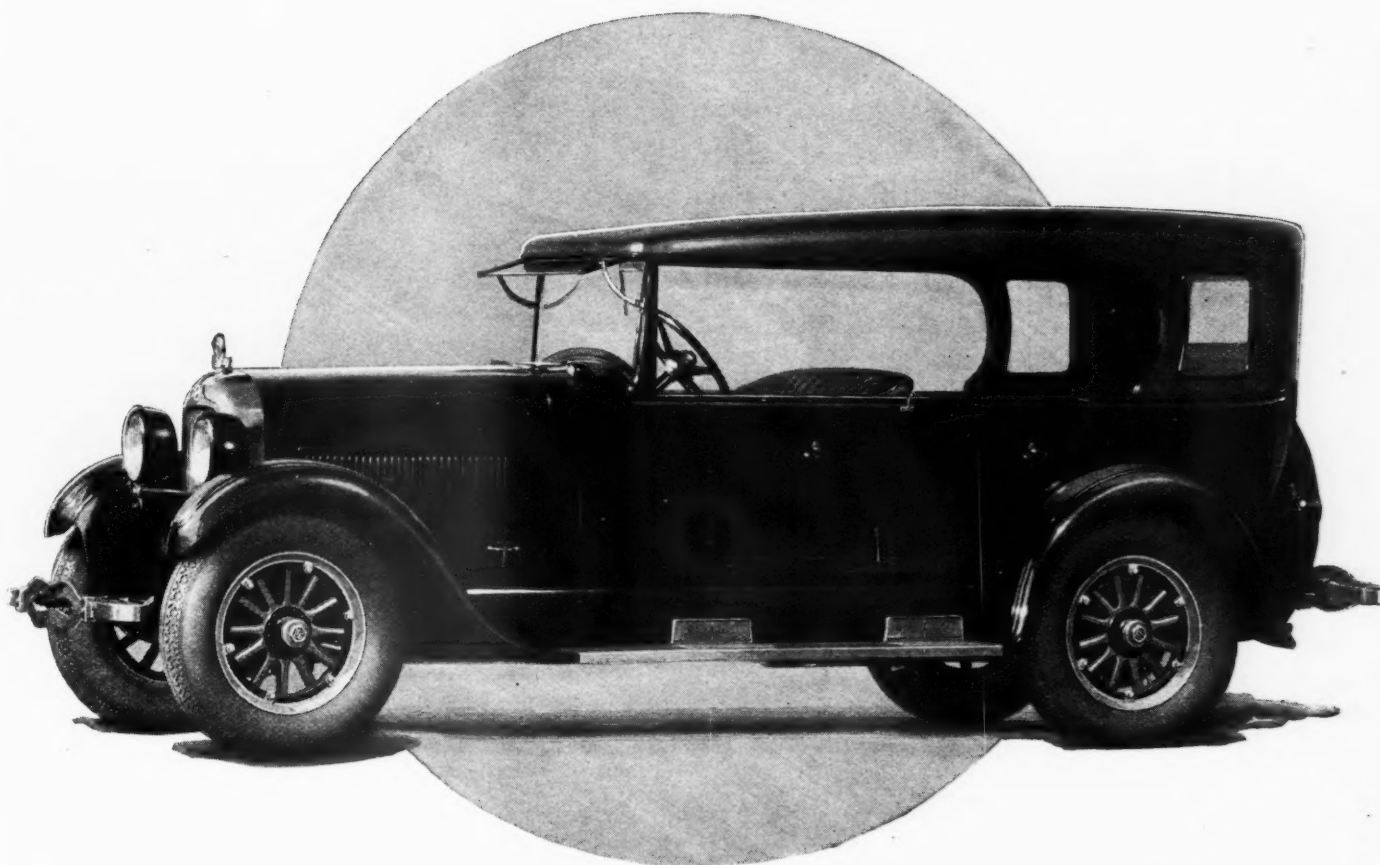
New York Chicago Detroit  
San Francisco



LAKE GLORIETTE  
Dixville Notch, White Mountains N.H.



# STUDEBAKER



## The New Studebaker Big Six Duplex-Phaeton

ONLY Studebaker builds the Duplex—an open and enclosed car combined. It is an exclusive Studebaker achievement—offered by no other maker.

If this two-fold convenience were the only feature of the new Big Six Duplex-Phaeton, it would still be a car of sensational value. But there are many others.

The Big Six is a full-sized, full-powered 7-passenger car—with many refinements in appearance and comfort. New beauty

in design and finish; steering mechanism, fenders and body lines especially designed for full-sized balloon tires; automatic spark control; plus finish and fittings you would not expect to find on any car below \$3000.

And this is only one of the fifteen new Studebaker models—mounted on the three famous Studebaker chassis. Thus Studebaker dealers are in the position to meet every demand of the quality buyer.

THE STUDEBAKER CORPORATION OF AMERICA • South Bend, Indiana

| STANDARD SIX<br>113-in. W. B. 50 H. P.                                 | SPECIAL SIX<br>120-in. W. B. 65 H. P.     | BIG SIX<br>127-in. W. B. 75 H. P.         |
|--|---|---|
| 5-Pass. Duplex-Phaeton . . . \$1145                                    | 5-Pass. Duplex-Phaeton . . . \$1495       | 7-Pass. Duplex-Phaeton . . . \$1875       |
| 3-Pass. Duplex-Roadster . . . 1125                                     | 3-Pass. Duplex-Roadster . . . 1450        | 5-Pass. Coupe . . . . . 2650              |
| 3-Pass. Country Club Coupe . . . 1395                                  | 4-Pass. Victoria . . . . . 2050           | 7-Pass. Sedan . . . . . 2785              |
| 5-Pass. Coupe . . . . . 1495   | 5-Pass. Sedan . . . . . 2150              | 7-Pass. Berline . . . . . 2860            |
| 5-Pass. Sedan . . . . . 1595   | 5-Pass. Berline . . . . . 2225            |   |
| 5-Pass. Berline . . . . . 1650   |   |   |
| 4-wheel brakes, 4 disc wheels, \$60 extra                              | 4-wheel brakes, 5 disc wheels, \$75 extra | 4-wheel brakes, 5 disc wheels, \$75 extra |
| (All prices f. o. b. factories, and subject to change without notice.) |   |   |

T H I S I S A S T U D E B A K E R Y E A R



The advertisement features a black and white illustration of two car bumper components. The upper component is a curved, flexible bumper with a strap and buckle, labeled 'Biflex Cushion Bumpers' in a stylized font. The lower component is a straight, cylindrical bumper with a central mounting bracket, labeled 'HALLADAY A Biflex Product'. Both components are shown against a background of diagonal lines. The Biflex logo is a shield with the word 'Biflex' inside, and the Halladay logo is a shield with a stylized 'H' inside.

**N**OW a great combination—Biflex and Halladay! Now a bigger, broader, more profitable proposition for dealers—two distinct lines sold under one fixed sales policy; a larger variety of styles and sizes for every make of car; a wider range of prices; interchangeable brackets for a majority of cars; a strong national advertising campaign to increase the prestige and popularity of both lines. Biflex—the company that built an industry—is now building a greater bumper business for dealers.

*Write at once for complete information on these combined lines*

THE BIFLEX CORPORATION, WAUKEGAN, ILLINOIS



# Dealers Everywhere are flocking to Oldsmobile

November 15, 1924

## AUTOMOBILE TOPICS

### WITH THE WHOLESALERS AND RETAILERS

#### NEW OFFICERS ELECTED BY BOSTON MOTOR CLUB

##### Series of Luncheons Arranged for the Motoring Public

At the annual meeting of the Boston Motor Club held last week in its headquarters at the Hotel Lenox, an entirely new group of officers and governors was elected. John C. Brink became president to succeed James T. Sullivan, Walter L. Tougas was made secretary, Dr. George W. Goode treasurer and Daniel S. Hickey general manager. John J. Watson was elected first vice-president, and committees were organized on traffic, roads, laws and ordinances.

#### IN THE TRADE

##### EASTERN STATES

**MASSACHUSETTS**—DORCHESTER.—Dorchester Oldsmobile Co. has secured selling rights for Auburn cars in this territory.  
**MATTAPAN**—John J. Delaney has obtained a franchise from the Nash Motor Co. to handle its product in this community.  
**NEWTON**—Claud L. Robertson has been appointed dealer by the Nash Motor Co. in this part of the State.

**NEW YORK**—ADIRONDACK.—J. J. Pepper has been appointed dealer by the Nash Motor Co. to handle its product in this territory.  
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**Brush Leaves Osburn-Abston**  
George A. Brush, general sales manager of the Osburn-Abston Co., has resigned his position. He attended the A. E. A. show in Chicago this week.

#### Packard Man to Teach

Announcement has been made by the head of the Michigan State Automobile School that J. E. Mills, general service manager of the Packard Motor Car Co., Detroit branch, is to instruct the special class in business, shop management and salesmanship. The course will comprise such subjects as: the location of a garage, layout of a building, equipment, tools, banking, accounting, etc.

**LINCOLN**—C. F. [unclear] has been appointed dealer by the Nash Motor Co. to handle its product in this territory.  
**LIVERPOOL**—Vernon J. Hopper has secured selling rights for Nash cars in this community.

**MOHAWK**—Johnson's Garage has obtained a franchise from the Nash Motor Co. to handle its product in this territory.  
**NEW YORK**—A three-story garage has been planned for the corner of Pearl street and Park Slip—A garage will be erected on Park avenue near 16th street—L. M. Kalt has purchased the Park Lane Garage located at 344-346 East Forty-eighth street for the Lehigh Realty and Construction Co.

**NYACK**—Arrow Garage has been appointed dealer by the Nash Motor Co. to handle its product in this territory.  
**OSWEGO**—Lillie Marston Garage has been appointed dealer by the Nash Motor Co. to handle its product in this territory.

**PERRY**—Oldsmobile Co. has secured selling rights for Nash cars in this part of the State.  
**PULASKI**—Albert W. Lewis has obtained a franchise from the Nash Motor Co. to handle its Nash cars in this territory.

**SKANEATELE**—Glennide Garage has been appointed dealer by Nash Motor Co. to handle its Nash cars in this territory.  
**WESTPORT**—N. Montville, Jr., has been appointed dealer by Nash Motor Co. to handle its Nash cars in this territory.

**PENNSYLVANIA**—CENTRAL CITY.—Central City Flint Co. has secured selling rights for Flint cars in this community.  
**EXETER**—Hilliker & Murny Motor Co. has obtained a franchise from the Nash Motor Co. to handle its product in this territory.

**LUTZTOWN**—William J. Schoedler has been appointed by the Nash Motor Co. to handle its product in this section.  
**FREEPORT**—Danke's Garage has been appointed dealer by the Nash Motor Co. to handle its Nash cars in this part of the State.

**MERCERBURG**—Fallon's Garage has obtained a franchise from the Nash Motor Co. to handle its product in this and neighboring territory.  
**ENRISVALE**—Superior Auto Repair Co. has been appointed by the Nash Motor Co. to handle Nash cars in this community.

**SOUTH**  
**VIRGINIA**—NEWPORT NEWS.—Motor Service Corp. has secured selling contracts for Flint cars in this territory.

**Towell Adopts New Firm Name**  
Effective November 1, the corporate name of the Cleveland Cadillac Co., was changed to the Towell Cadillac Co. The change in name occurred directly after the Company moved into its large and new quarters in the Towell Building, 30th and Cleveland streets, Cleveland, as was reported in columns at the time of the move. The Company has for the past year had branches in the following cities: Columbus, Toledo, Akron, Sandusky, O. Its territory includes all of Ohio and the presidency of H. Towell, is one of the best known merchandisers in the industry.

**GEORGIA**—CANTON.—Jones Mercantile Co. has obtained a franchise from the Nash Motor Co. to handle its product in this section.  
**MISSISSIPPI**—SHERBURN.—A. F. Mullins has been appointed dealer for Nash cars in this part of the State.

**KENTUCKY**—FRANKFORT.—Polgrove Bros. Motor Co. has been appointed dealer for the Nash Motor Co. to handle its product in this territory.  
**PRINCETON**—Clayton Road Co. has secured selling rights for Nash cars in this territory.

#### MIDDLEWEST

**OHIO**—CINCINNATI.—Twin City Motor Car Co. has obtained a franchise from the Nash Motor Co. to handle its product in this section.  
**FRANKLIN**—Franklin Service Garage has been appointed dealer by the Nash Motor Co. to handle its Nash cars in this part of the State.

**NEW LEXINGTON**—Walpole Motor Co. has been appointed dealer by the Nash Motor Co. to handle its Nash cars in this territory.  
**WEST MILTON**—Russell, [unclear] has secured selling contracts for Nash cars in this city.

**WILLOUGHBY**—Crowther Motor Co. has obtained a franchise from the Nash Motor Co. to handle its product in this territory.  
**INDIANA**—INDIANAPOLIS.—Circle Motor Co. is to be constructed on the south-west corner of Monument Circle and West Market street, will be a nine-story building instead of a six-story building as originally planned. The garage at 445 College avenue has been bought by S. G. Crawford. A warehouse at Market and Davidson streets has been opened by the Buick Motor Car Co.—The Excel Garage at 217 North Illinois street recently installed a battery service station.—The Guarantee Tire & Rubber Co. has opened a new branch store at 528-532 Virginia avenue.

**PEKIN**—Charles B. Wyman & Sons have been appointed dealer by the Nash Motor Co. to handle its Nash cars in this territory.  
**ILLINOIS**—SPRINGFIELD.—Harrington White Motor Car Co. will open its place of business at Prospect and East Center streets.

**CANTON**—Sawyer [unclear] has secured selling contracts for Nash cars in this part of the State.

What does this mean?  
It means that far-sighted dealers want to tie up to a manufacturer who is strong to-day, and bound to be strong tomorrow. Oldsmobile and General Motors offer you permanence!

OLDS MOTOR WORKS  
Lansing, Mich.

# OLDSMOBILE-SIX

PRODUCT OF GENERAL MOTORS

# *The New Good* **MAXWELL**

## All Eyes On Maxwell-Chrysler

The entire automotive industry is watching Maxwell-Chrysler. Since the announcement of "25 miles to the gallon"—"58 miles per hour" and "5 to 25 miles in 8 seconds"—the new good Maxwell has increased its popularity many-fold. It unquestionably holds the dominant position in the field of fours today.

That all America has taken the Chrysler Six to its heart is evidenced by the surprising number of these cars on the streets of every American city and town.

In view of these epoch-making achievements of the new good Maxwell and the Chrysler Six, car manufacturers, distributors, dealers and the motoring public have given these cars a position of supremacy in the motor car market.

No distributor or dealer can

afford to ignore the competitive force of Maxwell-Chrysler. The wise ones—seeing the handwriting on the wall—are seeking the Maxwell-Chrysler franchise. They are following the footsteps of a large number of the country's leading automobile merchants, such as R. H. Collins, Walter F. Wright, G. O. Washburn, L. E. Frey, and many others who have recently allied themselves with Maxwell-Chrysler.

The good Maxwell and the famous Chrysler Six are the outstanding car successes of today and the men who sell them are successful, not only for this reason, but because they are fortified by a friendly, helpful sales policy which has as its first objective that the Maxwell-Chrysler sales organization make money.

Write us today for full details about Maxwell-Chrysler franchise.



*All Maxwell and Chrysler dealers are in position to extend the convenience of time-payments, on a plan that is attractive to the buyer.*

MAXWELL MOTOR SALES CORPORATION, DETROIT, MICHIGAN  
CHRYSLER MOTOR CORPORATION, DETROIT, MICHIGAN  
MAXWELL-CHRYSLER MOTOR COMPANY OF CANADA, LTD. WINDSOR, ONT.

# CHRYSLER SIX

# MOTOR AGE

Vol. XLVI

Chicago, December 18, 1924

No. 25

## Merchandising Maintenance at a Profit

*How It Is Done Told by Packard Service Manager Who Says Shop Departments Contributed 39 Per Cent of Total Net Profits of the Factory Branches*

By H. N. DAVOCK

*Technical Service Manager, Packard Motor Car Co.*

.....  
*The following article prepared by Mr. Davock and presented before the joint service convention of the Society of Automotive Engineers and the National Automobile Chamber of Commerce at Cleveland in November sets forth very clearly the fundamental principle that the service or maintenance department of the automobile business should be profitable. He tells clearly how this objective has been definitely realized in the case of the branches and authorized service stations of the Packard Motor Car Co. For that reason his address is printed in full.*  
.....

U P until a few years ago our idea of service was principally one of keeping the owner's vehicle mechanically fit and in good operating condition at all times. Any thoughts of merchandising service at a profit were held to be incompatible with this main purpose. It was believed that in order to make a profit in the service department it would have to be at the expense of the owner and he already was standing all the traffic would bear. So we were elated when one of our service departments broke even and consoled ourselves with the thought that money lost in service comes back through increased sales.

In order to give preferred service the factory carried what now seems a ridiculously heavy inventory of repair parts and urged our points of distribution to do likewise. Our parts prices were being continually subjected to the owners' criticism and admittedly there were many inconsistencies about them; for example a right spring shackle might have cost twice that of the left. Small shops were competing with our service stations to the degree where it hurt not only from a service standpoint but from that of sales as well. There was no uniformity throughout the country with regard to repair charges or to the proper way of doing a specified repair. No two shops had the same tools, resulting in inefficiency and laborious methods in one shop and the contrasting results in another. Service organizations were developed with the main theme of the mechanical in mind with little attention being paid to the business side.

### *Conditions Generally Prevalent*

These conditions were not peculiar only to Packard, but prevailed in general throughout the industry. I could recount other conditions that prevailed at that time, but why go any further. The object of this paper is to tell what we have done to make Packard service something which is now beneficial to the owner, dealer and factory.

We became convinced that service in all its functions could be put on a profitable basis and not only maintain, but vastly improve the service to the owner. Here is what we did to merchandise our service.

First we attacked the problem of parts prices. We were confronted with the question of what is the cost. Very similar parts were produced varying widely in costs. Some parts were produced in production runs, others in our service shops; again some parts were produced on an overtime basis, all of which altered to a considerable extent any uniformity of costs. We could of course understand this, but from the viewpoint of the final buyer it was ridiculous. By grouping these similar parts, comparing the costs and still further comparing them with parts produced by other automobile companies we established uniform and reasonable list prices.

### *Factory Increases Sale of Parts*

We cannot have the same margin of profit on all parts. Parts such as bolts, nuts, screws, coil springs, gaskets, etc., are in common hardware class and their prices must be dictated by the prices charged by businesses other than automotive. Naturally the margin of profit on such parts as these must be smaller than on the other parts farther removed from competition. The final setting of a parts price is determined after viewing the part with the eyes of the average buyer and not entirely with reference to cost. Any merchandising concern must take no profit or a very small margin of profit on certain articles and a greater profit on other articles so a general average affords the concern a reasonable profit.

There were certain parts that we know were being purchased elsewhere than from us, such as gaskets, front end chains, spark plugs, etc., also such parts as piston pins, bushings, springs, bolts and other like parts. We wanted this business first from a quality standpoint, with its resultant protection to our vehicle owners, second because we knew it was profitable. We called a meeting of our largest distributors and laid our cards squarely on the table. We told them that if we could buy in large enough quantities that competition could be met, and in the case of gaskets and common parts of that class, we could quote as low and lower prices than they were then receiving elsewhere. On parts like piston pins, bushings, etc., we could greatly lower our price and could meet competition when quality was considered. They agreed to dis-



continue at once the purchase of these parts from sources other than the factory, and on this assurance we began revising our prices downward in anticipation of increased volume which was soon forthcoming.

The majority of our distributors now co-operate with us to the extent that they inform us when they are approached by parts salesmen and furnished us with those prices which are lower than ours. This is then investigated, a sample part is analyzed and if the part approaches ours in quality, we take immediate steps to reduce our cost and list prices. If to do this means that our margin of profit must be reduced, we make this reduction unhesitatingly, for we must keep on a competitive basis or expect to lose the business.

#### *Metallurgical Analysis Made*

On those parts such as piston pins, steering knuckle pins, etc., that are inferior to ours in quality, we purchase a quantity of them, make a complete metallurgical analysis and then make up displays showing a cross cut view of our part and the other part. The parts are usually mounted on boards about three feet square on which is fastened a "Take one" pamphlet holder. These boards are sent out to all distributors, where they are placed at the customer's counter in the parts department. The pamphlet which deals completely with parts, is invariably taken by the purchaser. As an example of what was accomplished in the way of increasing factory parts sales by reducing the selling price, I cite the following:

Twin-six cylinder head gasket—after reduction the price, sales increased 112 per cent.

Rear axle spring bushing, after reducing the price, sales increased 104 per cent.

In order to check our distributors we have a selected list of parts most commonly sold by the parts people, and we check this list from time to time against our distributors' factory purchases and compare the sale of these parts in ratio to those parts which can only be purchased from us. We can in all sincerity say, however, that we find very little of this wrongful practice by our distributors and dealers today. The reason is not through any strong arm methods on our part, but by meeting and beating competition at their own game.

#### *Study Distributors' Expense*

Our next job was to get our branches and distributors on a profitable basis in the service department. To get them on a competitive and comparable basis we had them furnish us with their direct and indirect expense given in detail, such as supervision, clerks, idle time, rent, etc., they also gave us the average rate paid mechanics.

These various expense items were then reduced to an hourly basis, and totaled up for each branch and distributor. A report was made covering the analysis of expense for the eight largest points of distribution and sent to the service managers of these points. That was started three years ago and is still mailed out each month. Chicago can readily see where their weak spots are and New York can consult with Boston to see how they are making such a good showing in idle time and vice versa on other items of expense. This chart has admitted a lot of light where darkness prevailed before, and has educated the service manager to view his job from a production standpoint.

## *How Repair Prices Were Standardized*

To increase efficiency in the various parts departments we ran a stock contest offering substantial prizes to the ones making the best showing on turnover, reduction in merchandising, cost and reduction in inventory. This had to be accomplished with no increase in back orders.

The value of this contest was in the good that was accomplished through competition between the various stock managers. If we had simply issued instructions to each of them individually, I am afraid we would not have accomplished much, but when we made a game of it and let them know what the other fellow was doing, it was not long before results materialized. In this way they established for themselves standards for turnovers, and merchandising costs which we could not have established for them.

You would not think that aggressive sales methods could be very well employed in a parts department, but as an example of intelligent selling I remember that some time ago several of our distributors were overstocked on steel wheels, due to a changeover in equipment. To get rid of them was a problem, but the manager of our New York parts department solved it by prominently displaying one wheel on the customers' counter and another in the service sales department. They were attractively mounted on a stand with a card announcing that a set of these wheels could be purchased for a very reasonable price which was quoted. A number of sets were sold and finally the used car department was convinced by him that cars would sell more quickly equipped with these wheels. A set was tried and the car sold more quickly than others with wood wheels. This resulted in the used car department taking over all the steel wheels. This was then tried out in the other points with the same results.

We now come to the repair department where we found our greatest problem. There were dissatisfied owners, particularly with repair prices, which varied anywhere from 20 to 80 per cent, depending on equipment and the mood of the mechanic. Some distributors were using home made flat prices, others

the maximum estimate system and still others were unalterably opposed to anything but straight time and material.

We began by working out standard times and standard specifications at the factory. After being completed they were sent piece-meal to our largest distributors and branches where they were criticised or approved. They were only adopted after a majority vote from the field. The allowed times were ample for the average mechanic, but did not take care of the drone. Certain leader operations were featured such as "Clean carbon, grind valves, tune motor," etc. After this work was completed the standard specifications were printed and sent to all Packard branches, distributors and dealers, with the request that they be used. How we saw to it that they were used will be covered later.

#### *Advertising Matter Prepared*

The majority of our distributors and dealers put these standard prices and specifications into effect at once. They kept a standard operation record designed by the factory to show the progress made on various operations, and when a certain distributor could not better or meet the allotted time on a particular operation for a given number of jobs, he got in touch with the factory who either revised the time or sent a mechanic to show him how to do it. We knew that if Boston, Chicago and Pittsburgh could do an operation in a certain time that surely Baltimore could do it if properly instructed. The standard specifications and prices made it far more easy for the field to sell repair work, for all elements of uncertainty regarding the work and price had been removed. The customer was assured that the factory and not the dealer had laid down the specified operations and charges. For the first time the field began to note and record how long it took to do a specified repair, and when you can get anyone to make a check of their work, you can rest assured that efficiency will follow.

We next prepared advertising matter leaving a space for the imprint of the distributor, which drove home strongly the

advantages of the Packard Standard Specifications and prices. In this advertising we prominently displayed the leader operations. This information prepared in booklet form was sent to the owners by our distributors.

We organized a service tool department to standardize those tools best adapted to Packard work. New tools which were developed by distributors were subjected to criticism by other distributors and the factory tool department. After selecting all the good features, these tools were produced in quantities and sold to the field at cost plus 15 per cent handling charge. We concentrate our efforts on designing those tools especially adapted to Packard cars and further to tools that are used on those frequently performed operations. A tool that will speed up the performance of a "carbon and valve" job is more important than one that may be used by the average service station only once or twice a month. We consider this service tool work very important and absolutely necessary if we are to whip competition.

Twice each year our standard times and prices are revised for operations as well as parts, for as time goes on it naturally follows that efficiency is increased in the repair shop through familiarity with the job or improved tools. Prices are reduced accordingly so that we are continually making it more difficult for competition.

#### How Opposition Was Met

At the time we inaugurated the standard price system we knew that opposition would be encountered from certain of our distributors and dealers. It was a radical change, and the old time and material method of selling service was to their minds the only safe one. To meet this expected

opposition we put into the field six men who were trained in this work. Their job was to visit each distributor and dealer, show him the many advantages of the new plan, how it should be handled to produce the best results. In other words, he stayed there until the dealer was sold on the idea and agreed to put it into execution.

For a period of two years after we started this, these men called on each distributor and dealer twice each year to see that the Standard Specifications and prices were being used. Incidentally when they made these visits they filled out a questionnaire covering the dealer's service department in general so that we have a good picture at the factory of the service in the field.

Now that the pioneer work has been done we only have three of these men in the field. It is their duty to not only report conditions, but to assist the dealer in every way to make improvements so that the maximum profit consistent with good service can be secured in the business of merchandising service. Good features in effect at one dealer's establishment are carried on to the next, both by these field men and by general letters from the factory.

In addition to the educational work of these field men we hold periodical service meetings at the factory to which the various service managers are invited. In addition to the mechanical side of the business, considerable time is spent in discussing better ways of merchandising service. Subjects such as proper selling methods, perpetual follow-up of owners, service accounting, organizations, etc., are discussed and many helpful suggestions are received.

Again, once each year four zone meetings are held in various

sections of the country. At these meetings, which are attended by the general managers, we attempt to drive home those fundamentals which will enable them to not only render a higher grade of service to the owner, but will increase their total net profit through increased efficiency.

#### Results Which Were Achieved

The proof of the pudding is in the eating, and results tell the final story. I cite for example the progress of our three branches, New York, Chicago and Detroit, (See box.)

You will note from the comparison and the tables that the business handled remained practically the same. This represents business from a dollars and cents standpoint. In reality the volume of repair work was much larger, but from a monetary standpoint it did not increase for several reasons. (1st) The reduction of parts prices cut down the money volume of parts sales. (2nd) The Standard Specifications and prices reduced the former exorbitant charges for repair work, but through increased efficiency in the shops profits were increased. (3rd) The advent

and simplicity of the Packard Six made possible repairs in one-half to one-fifth the time consumed in repairing previous models. Conservatively speaking, we are now handling four cars in the time formerly given to one. Incidentally the simplicity and accessibility of this car has been a great boon to our distributors in the way of mechanics. Intricacy of the former models made it necessary for a mechanic to be in the expert class, whereas the work on the present line can be competently performed by average mechanics, who are more plentiful than experts.

In the fiscal year just closed the service department of these three branches made a good portion of the total net profits. Like progress has been made by our distributors. How was it done?

1. Elimination of former red tape and excess personnel.
2. Training of service personnel in business methods as well as things mechanical.
3. Rigid adherence to Packard Standard specifications and charges which has won the confidence of our owners, inasmuch as they know uniform charges prevail throughout the country.
4. Use of standard tools and equipment.
5. Proper management of parts department and application of sound merchandising principles.
6. Close contact with owners by telephone, personal calls and a liberal use of direct by mail advertising.
7. Last but not least—simplicity of car design.

The next thing on our program is to be an educational course for service salesmen. This will be similar to the Packard Sales Educational Course which was successfully inaugurated a year or so ago. We are still confronted with the problem of peaks and valleys in the course of a year's business and believe improved selling methods can bring about a steadier average. The depressions or valleys make an expensive proposition, for while you can reduce your productive help, there is a major portion of the direct and indirect expense that must be borne whether the business is poor or good.

Let us assume that it costs \$1.40 for each productive hour

(Continued on page 37)

#### PROFIT FROM THE SERVICE DEPARTMENT

*THE following table shows the percentage of profit made on total service business handled by the Packard branches at New York, Chicago and Detroit, for five years:*

|                                |                     |
|--------------------------------|---------------------|
| Year ending Aug. 31, 1920..... | 1.3 per cent profit |
| Year ending Aug. 31, 1921..... | 1.8 per cent profit |
| Year ending Aug. 31, 1922..... | 6 per cent profit   |
| Year ending Aug. 31, 1923..... | 10 per cent profit  |
| Year ending Aug. 31, 1924..... | 11 per cent profit  |

*The increase each year as compared with the preceding year in the percentage of profit from the service business as compared with the volume of that business is shown in the following table:*

| Year      | Business                   | Profit Increase |
|-----------|----------------------------|-----------------|
| 1921..... | 5 per cent increase.....   | 39 per cent     |
| 1922..... | 17 per cent decrease.....  | 170 per cent    |
| 1923..... | 14 per cent increase.....  | 87 per cent     |
| 1924..... | 0.6 per cent decrease..... | 9 per cent      |



# Repair "Policy" Helps to Close Sales

*Washington Distributor Issues Legal Document With New Car Sale Fully Defining Maintenance Service That Falls Under Guarantee and What Owner Must Pay for*

A REPAIR policy drawn up in legal form, lithographed in the style of an insurance policy and bearing the seal of the firm, is issued with every new car sale by Dick Murphy, Inc., Oldsmobile distributor at Washington, D. C.

In a letter to MOTOR AGE Mr. Murphy, president of the company, states that this "policy" has helped materially in closing sales. About the purpose and benefits of this "policy" Mr. Murphy writes:

## To Preclude Arguments

"We decided to use the phrases 'maintenance department' and 'repair policy' rather than 'service department' and 'service policy,' and in order to preclude argument of any nature after the delivery of the car on the part of the purchaser, who uses as his basis certain statements that he claims have been advanced by the salesman, we brought into being our Repair Policy which, in addition to eliminating arguments, has helped us materially in closing sales."

The border of the repair policy is printed in green and in the lower left-hand corner the corporate seal of the company is impressed upon a gilt sticker. The document sets forth in 10 specific paragraphs the exact conditions that will govern replacements, adjustments or repairs under the manufacturer's guarantee.

This interesting document is reproduced in an adjoining column for the information of dealers who are confronted with problems similar to those which led the Dick Murphy company to devise this plan.

Nº 1129

## Repair Policy

In Consideration of the purchase by Sample (hereinafter called the Purchaser),

Address \_\_\_\_\_

of Oldsmobile type \_\_\_\_\_ Serial No. \_\_\_\_\_

Motor No. \_\_\_\_\_ from Dick Murphy, Inc. (hereinafter called the Distributor) the Distributor issues this non-transferable repair policy to the Purchaser

**First:** For a period of thirty days from date the Distributor will make all adjustments without charge provided the automobile is delivered at the Distributor's Repair Department and that no adjustments have been made on it except those made by the Distributor's Repair Department and that it has not been damaged through accident or neglect. After thirty days from date all work done on the automobile will be charged for at the Distributor's usual rates.

**Second:** All parts upon which credit is given, either by the Olds Motor Works, Lansing, Michigan, under the Manufacturer's Warranty, or the Distributor, will be installed without charge by the Distributor for a period of thirty days from date. After thirty days from date, all parts, plus the cost of labor necessary to install same, will be charged at the Distributor's usual rates, and such parts that the Purchaser believes are subject to Manufacturer's Warranty will be returned to the Olds Motor Works, Lansing, Michigan, for examination and if credit is issued to Distributor, Purchaser will immediately receive credit from Distributor.

**Third:** If it becomes necessary and unavoidable to do gratis or charge work away from Distributor's Repair Department, an extra charge will be made covering the time of the mechanics going to and from the point where work is done, plus the cost of transportation, board, lodging, freight, or express, and other incidental expenses which would not be normally incurred where work is performed at the Distributor's Repair Department.

**Fourth:** When overtime work is required, same will be upon a basis of one and a half times the Distributor's usual rates, excepting when it is performed on Sunday and legal holidays, when it will be two times the Distributor's usual rates.

**Fifth:** If, at any time gratis work is being done, it is necessary to do other repair work, same will be charged for at the Distributor's usual rates.

**Sixth:** The Distributor makes no warranty whatsoever in respect to tires, rims, horns, batteries, speedometers, accessories, and starting, ignition, or lighting apparatus, as they are warranted by their respective manufacturers. Upon request, the Distributor will assist in presenting claims on any of these items.

**Seventh:** The Distributor is not responsible for loss or damage to automobile, property contained therein or thereon due to fire or theft while same is in the possession of Distributor. If Purchaser's automobile is driven by Distributor's employees at Purchaser's request, it shall be so driven at Purchaser's risk. Repair Department hours are as follows: Week days, except Saturday, 8 A. M. to 5:30 P. M. Saturdays 8 A. M. to 1 P. M. Automobiles will not be received or delivered except between these hours. Storage charges of 50c per day or fraction thereof will be made, if automobile is left more than 24 hours after work is completed. All charges covering parts, labor, and storage must be paid for in cash or certified check prior to the delivery of the automobile.

**Eighth:** It is expressly understood that the failure of the Distributor at any time to enforce any or all of the above provisions shall not be regarded as a waiver of these provisions and the Distributor may at any time in the future enforce any or all of the provisions herein set forth.

**Ninth:** This is a local repair policy and nothing herein contained shall be construed as binding upon the Olds Motor Works, Lansing, Michigan.

**Tenth:** The Distributor insists that the Purchaser be given business-like and courteous attention at all times. When such is not received the Distributor will regard it as a favor if the Purchaser will advise an executive of the Distributor, giving specific information.

The Distributor has executed this policy but same is not valid unless countersigned by an executive of the Distributor

*R. J. Murphy*  
President.

Countersigned: Sample

**DICK MURPHY, Inc.**  
R. J. MURPHY, President  
DISTRIBUTORS  
*Oldsmobile*  
WASHINGTON, D. C.  
POTOMAC 1000

REPAIR DEPARTMENT  
1625 L Street N. W.  
DISPLAY ROOM  
1835 14th Street N. W.

Repair policy issued by Washington (D. C.) distributor to buyers of new cars

## A BOOK FOR SALESMEN

A booklet entitled "How to Successfully Sell the Wills Sainte Claire" has been published by Wills Sainte Claire, Inc., Marysville, Mich. The booklet was written by C. Harold Wills, president of the company. It contains valuable instructions for salesmen under the headings of

"Know What You Are Selling," "Analyze Yourself," "Study the Car," "Prospects," "Price vs. Quality," "The Approach," "Style and Beauty," "Comfort and Convenience," "The Demonstration," "The Order," and concludes with a detailed tabulation of 18 outstanding features of the Wills Sainte Claire car.



# Sound Basis for Automobile Financing Defined as New Association Is Formed

*Representatives of Bankers and Financing Companies in Chicago Convention Adopt Code of Recommended Practices—12 Months Considered Maximum Time for Safe Extension of Credit*

By CLARENCE PHILLIPS

Chicago, December 13.

**A** NEW force has entered the field of automobile financing. It is known as The National Association of Finance Companies which was formally organized during a convention held at Hotel La Salle, Chicago, on Dec. 10 and 11.

It is said that the association represents the great bulk of capital invested in this business. Nearly 300 companies sent delegates to the meeting—companies of all sizes, with combined operations that cover every section of the United States. Attending the meeting also were forty or more bankers from various cities as well as representatives of some of the large automobile manufacturing organizations who took keen interest in the proceedings.

## *Two Important Devices*

Formation of the association was the outgrowth of meetings and conferences of finance company executives and bankers, through which, at the original suggestion of the bankers, it was hoped to evolve a movement that would have the effect of curbing reckless automobile credit and establishing sane practices in the time-payment business.

Two important devices for use to this end were instituted at the Chicago gathering—one, the adoption of a policy prescribing what is considered a safe credit extension limit on automobile retail sales and a safe minimum down payment—the other, the National Association of Finance Companies, itself, which will endeavor to see that the approved practices are universally applied. The association will have its headquarters in Chicago.

The points of policy to which the association will urge all concerns guaranteeing automobile retail paper to adhere and as embodied in resolutions adopted, are as follows:

On monthly installment paper covering new passenger cars, the maximum maturity of such paper shall not exceed twelve months, payable in equal monthly installments.

On monthly installment paper covering new passenger cars the minimum down payment by purchasers shall not be less than either one-third of the cash or thirty per cent of the time-selling price at point of delivery, including accessories and equipment.

On monthly installment paper covering used passenger cars the minimum down payment by purchasers shall not be less than either 40 per cent of the cash or 37 per cent of the time selling price at point of delivery, including accessories and equipment with the maximum maturity of 12 months, payable in equal monthly installments.

## *Recourse a Debatable Question*

These articles are effective Feb. 1, 1925, east of the Rockies and as soon thereafter as possible west of the Rockies.

The program as recommended by the committee which

drew it up and as indorsed by the bankers, as not only a desirable, but a necessary step, was accepted by the association without alteration. The resolution on used car paper, however, was adopted with the understanding that a mail vote would be taken later to determine whether the article should be amended to require the dealer's indorsement on all used car paper. Supervising the referendum will be a committee composed of three bankers, three representatives of recourse financing companies and three representatives of non-recourse companies.

Needless to say the question of recourse and non-recourse was injected rather warmly into the proceedings on several occasions. It was obviously the will of the majority that for the time being at least this issue should be passed over and that the convention should center its first attention on a program on which the delegates were more generally agreed. Expressions of the delegates, interested primarily for the moment in launching a national association, therefore, did not indicate just how the majority felt on the proposition of recourse and non-recourse contacts. At the same time enough was said to suggest that the association is not through with the issue. There seemed to be a fairly even division of opinion on the proposal to demand the dealer's indorsement on all used car paper and consequently the result of the referendum to be taken is highly speculative. It was very apparent that both schools were well sold on their own side of the argument involving the dealer's indorsement and to have continued the discussion might conceivably have made it impossible to have completed perfection of the organization at that time.

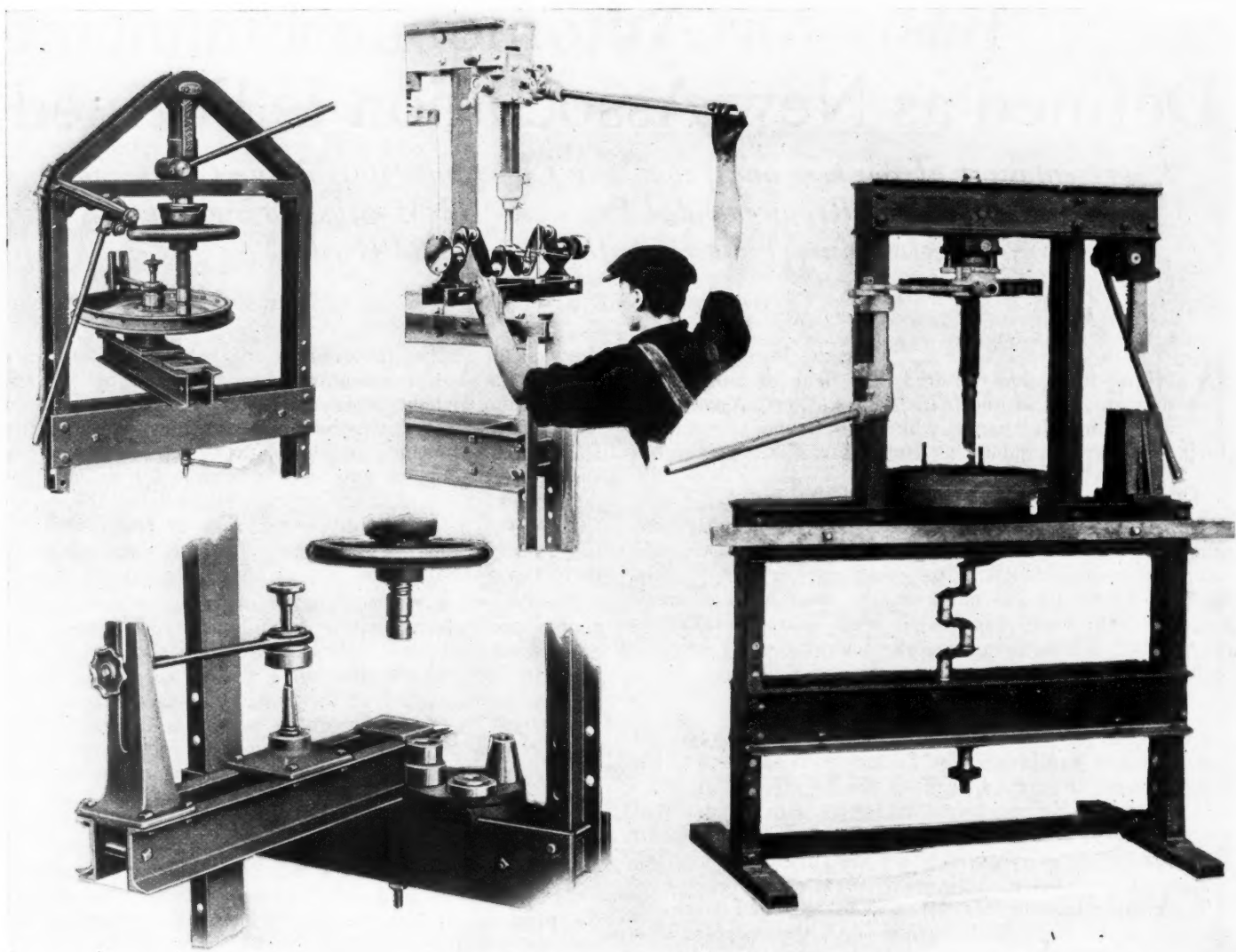
## *Position of N. A. D. A.*

A material hitch in the original program of the conference committee was threatened when it was reported that one of the largest financing companies, handling Ford paper exclusively, had announced that it could not subscribe to a policy of one-third down on new cars. It was desirable to have this company's support if possible, so the resolution was held over until the second day when it was adopted by the organized association with the understanding that it would be reconsidered if an unfavorable report were received from the company in question later in the day. The company later gave the association emphatic notice that it would support the entire program, including the resolution relating to down payment. This company's action, however, opened extensive argument on the point of excluding low priced cars from the one-third down provision, but the consensus was that nothing below a third down is a safe minimum.

Much significance attaches to a statement presented to the association by the National Automobile Dealers' Association through Vice President C. E. Gambill.

Mr. Gambill called attention to principles on the subject of automobile crediting which were enunciated by the

(Continued on page 33)



*A few of the operations for which a press can be used. The upper and lower left views show a press employed for straightening a disk wheel, while the others show a crankshaft being straightened and removal of a flywheel from a shaft*

## Bury Hammer and Bring Out the Press

*Many Operations Are Possible With One of the Straightening or Arbor Variety.  
Mutilation of Parts Avoided by Using Right Kind of Equipment*

By B. M. IKERT

*(This is the ninth of a series of articles on the profitable use of shop equipment.)*

EVERY cartoonist has at some time or other poked a little fun at the automobile mechanic in the act of wielding a good sized hammer on some part of the car's mechanism where better judgment dictates that anything but a hammer should be used.

Hammer blows are all right when properly directed and the hammer in the hands of a blacksmith, carpenter or mill worker is used to advantage on the work in question. But outside of a few like tapping a certain punch or cold chisel, there is little use for a hammer in the hands of the automotive mechanic.

In the better operated shop the hammer was superseded long ago by the more efficient arbor press. But the press has not as yet become established through the smaller shops to any great extent.

The hammer still plays an important part in many of the smaller shops and in view of the fact that most of these shops also lack special equipment for work on motor vehicles of every description the arbor press is needed in them more than in the larger shops.

### *Best Procedure to Follow*

The latter usually can afford to buy special fittings such as gear pullers, etc., to do a variety of work on the different makes of motor vehicles, but this is often out of the question for the man with a shop in the small town. Hence, a press which incorporates a combination of features to meet a variety of jobs is a distinct advantage in the smaller shop. This does not imply that a press is of no use in the larger shop.

In fact, most well conducted large shops will install a press as one of the first essential pieces of equipment.

Many jobs have to be turned down by a shop lacking a press and often a machine is used as substitute for it, not always the best thing. Thus, a crankshaft might be straightened between the centers of a lathe, but every lathe maker will tell you this is none too good for the centers. Besides it is better to straighten a shaft on V-blocks in a press that will stand up under the strain. Again, it is possible to use a drill press as an arbor press, but here again, unless the press is a large one and used only for forcing small bushings in and out, the spindle will be subjected to severe stresses.

There are many different makes and



sizes of presses on the market and the very small ones can be mounted on the work bench. They are also called straightening presses and are useful in straightening the smaller sizes of crankshafts, camshafts, rods and shafts of every description.

The shafts are supported on V-blocks at the journals, the latter having first been tested with a micrometer for roundness. Pressure is then applied to the shaft at the middle bearing, so the shaft is sprung slightly past its true axis. This is done in view of the fact that every shaft will spring back some after the pressure from the feed screw is released. While still held in the V-blocks the shaft is tested with a dial indicator to check the "run out." Many presses now on the market are furnished with V-blocks and dial indicator attachment, so the shaft does not have to be removed to a surface plate for testing.

Imagine a shop trying to straighten a large crankshaft or other shaft by any other means and knowing that the job has been done accurately. Certainly such a shaft could not be hammered and yet the hammer is used altogether too frequently by the unthinking man on many other jobs which call for the press.

Every now and then a wrecked car comes in with a bent front axle I-beam. Here the large arbor press comes to the rescue and makes a quick job of straightening it. Some shops heat such an I-beam and straighten it in a large vise. This may be all right, but it always brings up the old question about straightening such parts hot or cold.

### Much Can Be Done With Arbor Press

Right here a word ought to be said about hammering in the shop. Certainly there is nothing very musical about a series of hammer blows and always when we see a mechanic vigorously applying a hammer we are reminded of the cartoonist who invariably pictures him in this act. Every shop manager knows that the morale of a shop is better when a job is quietly and efficiently performed with equipment to take the place of a hammer. Let a mechanic strike a hammer blow and every one in the vicinity

turns toward him to see what's going on. But nobody knows when an obstinate bushing is being removed under the arbor press by the same mechanic. That is a point to remember in shop morale, especially if customers come in contact with the shop as they do in the smaller establishments.

### Products Frequently Improved

So much can be done with an arbor press that it would require reams of paper to tell it all. And what is more the makers of these presses constantly improve their products to handle additional work. For example, the advent of the disk wheel has brought up the problem of straightening such a wheel when this becomes necessary. It means holding the wheel at the center and applying pressure at the rim wherever needed. Consequently some of the presses have a disk wheel straightening feature that is useful to every shop.

One of the most frequently performed jobs is that of removing and installing bushings of every description and for that a press is highly essential. Many times, of course, the job is such that the parts cannot be brought under the press and in that case the special bushing drivers, gear pullers, etc., are used. But where the units have been taken down they can be placed under the screw of the arbor press.

The larger arbor presses are built high enough off the floor so that long shafts with gears attached to their ends can be placed on the table of the press for forcing the gears on or off. The same is true of a flywheel put on a crankshaft with a taper fit and which must be forced on and off.

It is possible to get chucks for arbor presses to be used in firmly holding shafts, etc., in upright positions while pressing on and off gears, sleeves, and the like. One of these chucks is so built that as the pressure becomes greater tapered cones are wedged into a circular block, thus holding the shaft more tightly. This device is especially useful in pressing sleeves on Ford drive-

shafts and pinions on Ford and Chevrolet rear axles.

It is quite a job to force ball races off shafts without injury to the former and one maker of a press furnishes an attachment to support such races and similar delicate parts while they are being forced off.

Also when it comes to riveting such parts as a ring gear to the differential carrier, it can be done to better advantage on a press. The rivet is thus expanded by the great pressure of the press and will fit more tightly into the hole for its entire length. A fitting for doing this on the press is furnished by one maker.

### Used for Connecting Rod Work

Some of the presses have a device for straightening and testing connecting rods. It also is possible to use the press for broaching the big ends of connecting rods as well as the piston pin bushings. In this the press is a most useful tool any shop can have, as broaching is rapidly becoming considered the ideal way of finishing these bearings.

Almost every shop in the smaller towns is called upon to do some Ford repairing and the job of relining the transmission bands is frequently performed. Here again the press comes in handy as the market affords attachments whereby the old rivets can be punched out, new holes punched in lining, new rivets headed and countersunk into the lining. All this means a saving of time and better all around work.

It will readily be appreciated by every service manager and mechanic that a steady pressure is far better than a series of hammer blows on any job. Hammer blows generally mean battered threads, bearings or sleeves and there is always the danger of getting a part "cocked" by hammering it on one spot only. When an inner race of a bearing, for example, is forced off a shaft by an arbor which bears on the race over its entire surface, the shaft will stay at right angles to the race and the latter will come off easily and without injury. But the hammer and drift method of doing a job is at best doubtful.

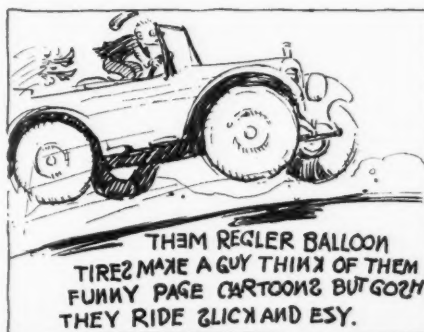
## DAN'S DIARY

### DAN'S DIARY

Dec. 17.—There is a lot of guys making a lot of fuss over a lot of things nowadays but they is one thing that is about as clear as mud to most folks and that is balloon tires. I've tawked to fellows that had been selling tires for a living for several years and no 2 of them has got the same idea about what they do, i mean the tires not the guys cuz most of them is jest puncture fixers and dont know much.

One bird that i tawked to got all het up over the subjec and forgot to look for a hole on both sides of the tube he was fixing and in a few minutes the man brot his car back flat and was he sore? O boy! what he said to that bird! him being late for a bizness date out in the country and no way to get there.

But as i was saying this bird got all het up because his competitors was taking in the old small size tires and allowing so much for them that they was no mony in the bal-



loon bizness no more. Same old stuff as is worying everybody about used cars. Well some guys aint got no sents thats all.

Some of these guys claim balloons aint no good cuz they puncture to ezy and some claim they dont puncture. Me thinking its funny if a nail will stick threw something pressing on it only about 30 pounds quicker then it will threw the same kind of stuff pressing about 70 pounds.

One owner which came threw here was shure sold on them but he had honest to gosh balloons about 7 inch in diameter and if i was to express myself about them its these little balloons wich aint no balloons a tall but only jest oversize thin cords wich is giving all the trouble becuz they aint got much bearing surface like them big ones has and the big ones a fellow can run on about 10 pounds and never bump.



# Displaying and Storing Merchandise

*Profit Comes From Putting Goods Out Where Customers Will See and Be Attracted to Them, Says Successful Retailer Who Tried It*

By WALTER ENGARD

## PROFITS SERIES

Utilization of Plant Capacity—No. 4

Here we are told how one merchant without increasing his space made better use of it for displaying a wide variety of automotive merchandise with the result that his business and his profits were greatly increased. Of course it is important to store reserve stocks in an orderly manner so that the least possible space will be occupied and so the merchandise will be readily accessible to floor salesmen. But the system described here takes the goods off the shelves in so expeditious a manner as to appeal to every good merchant. The writer of this article is a practical retailer and speaks from his own experience.

"DON'T bury it—push it" is a slogan I have recently adopted in my store and it has proved a real stimulus to sales. I am confident that its application in any retail establishment would be the direct means of placing many an extra dollar of profit in the cash register through extra sales.

The adoption and the carrying-out of this slogan in my store has enabled me to rid my stock of much merchandise which had previously been checked off as "dead" stock. It has "pepped" up the turnover of many an otherwise slow moving item and has proved very conclusively that even the sale of the most common merchandise—items for which there is a constant demand and to which very little sales promotion thought is given—can be greatly expedited.

### Procedure in Average Store

It seems to me that the most common deficiency to be found in the average store is the lack of any real selling effort, and my store was no exception. What I mean is that there is no special effort put forth to "sell" merchandise. When a customer comes in we attend to his wants. If it is necessary to use some salesmanship ability to "sell" him our particular merchandise we apply that, but there is no effort put forth to sell the customer some additional item of merchandise for which he has not expressed his desire.

In the average store, when merchandise is received it is placed in its customary location on the shelves, in the bins or in the show cases and there it rests until some customer comes in with a predetermined intention of purchasing that particular item and asks for it.

For a long period of time when we were experiencing abnormal prosperity—when people were making money easily and spending it freely—sales were exceptionally good and there was no special need for pushing the sale of merchandise. But conditions are the reverse

today. Sales have slowed up—people are not spending so freely and it is necessary for greater selling effort if sales are to be maintained.

With this thought in mind, I determined to go after sales more vigorously. My first idea was to promote sales by the power of suggestion—to suggest various items of merchandise to customers as they came to my store for purchases. But I soon found that it was impossible to cover the entire stock in this manner. While a large volume of extra sales were made in this way, I was sure that a much greater volume could be had if the proper system could be worked out.

It is impossible to guess everything the customer might have a need or a desire for. The practice of suggesting "companion" articles—items which have a direct relationship to the item purchased—is very commendable and is productive of many sales, but I found that it did not cover the widest range of my sales possibilities. Many a customer would have a need or an undeveloped desire for some item entirely foreign to

the article already purchased and this method of suggesting additional merchandise would miss it entirely. Also it is bad business to carry the practice of suggesting merchandise too far. It becomes a bore to the customer and if persisted in, will drive the customer from the store. Suggestion selling has to be handled diplomatically or it will do more harm than good.

### Important Phases of Selling

I finally determined that the best method to promote the sale of merchandise was through display. Of course it had always been my practice to display merchandise in about the same degree as employed in most stores, on the shelves, in the show cases and upon the ledges. But my thought was to display my merchandise more extensively—to show as much merchandise as possible right out where the customer could get a hold of it and inspect it.

I installed several display tables upon which I placed numerous items and immediately I began to note an improve-



Here is a splendid example of how a full line of cars may be displayed when room is available. Note that the cars are not crowded. The same principle can be applied to smaller show rooms. This is a view of the show room of the Buick branch at Flint, Mich.

ment in sales in the lines thus displayed. Formerly I had kept my display cases clear of any merchandise on top, but I converted the tops of my display cases into display tables and here I displayed literally dozens of extra items in an orderly manner and I immediately noted extra sales upon the items thus displayed.

Just to test out the selling ability of these displays I took one particular item upon which my sales were formerly running around 6 to 8 every three months where it had been displayed in a prominent section of my show cases. I placed this item on top of the display case where the customer would see it readily and could inspect it closely and my sales on this one item jumped from less than one a week to six and seven a week—an increase of 600 to 700 per cent. Another item for which there was a constant, steady demand, which, when put on display, showed an increase of better than 40 per cent and when placed back in its former location on the shelves immediately dropped back to its former sales, but when placed back on display immediately showed an increase of equal proportion. The success of displays lies in several important phases of selling. First, it places the merchandise right out under the customer's nose and it acts as a reminder should he have had some similar item in mind. It also acts as a suggestion, and suggestion in the right place and at the right time means selling.

The big point is, however, it gives the customer an opportunity to pick the item up in his hands, to examine it closely and to get acquainted with it. A customer will frequently see an item displayed in the show window or in the show cases or upon the shelves which interests him, but he may hesitate to ask to see that particular item—he doesn't know whether or not he would want the item and he hates to annoy the dealer and take his time for nothing, so he passes it up and the store loses a sale. Had the item



Out where the customer can see the merchandise is the motto of this merchant, F. W. Packer, at Sheboygan, Wis. Note also the orderly arrangement of the goods on the shelves

been out where he could examine it without annoying the dealer, and he could get acquainted with the item, perhaps he would have made the purchase.

#### Sales Are Increased

I had one item in stock in particular, a rather expensive item, which showed a single sale in six months. I averaged about two of these items a year. Formerly they occupied a certain place on the shelves and were rarely ever disturbed excepting for a trip or two a year to the show window or the display cases. Following out the slogan I had adopted, this item was taken down from its hiding place and placed on display right on top of the show cases. It was surprising the number of customers who expressed themselves favorable to this item and now I am averaging a sale a month, selling twelve now where I was only selling two.

Old stock which had been practically discarded was gotten out and cleaned up and placed on display and a special price put upon it. I practically cleaned my stock of every "dead" item with only a nominal sacrifice in profits.

I could cite scores of instances where this new method of display increased my sales. Many an item the sale of which I had almost concluded wasn't worth while, when put on display, immediately showed that there were worth-while sales possibilities.

The selling power of that combination, suggestion and accessibility, is a tremendous power in making of extra sales and will do more toward building a larger sales-volume than any other thing the dealer can do.

(The profits article in next week's issue of MOTOR AGE will be on, "To Build or Remodel," by Tom Wilder.)

### Why Tires Wear Unevenly

The tire dealer is often asked why it is the tires on the right hand side of the car will wear out faster than those on the left hand side. This condition is ascribed to the pitch of the road which throws more of the car weight to the right side than to the left. For example, if we would exaggerate this condition to the point where the car was just ready to tip over, we would find that all of the car weight was on the right wheels and none of it on the left wheels. This shows that in proportion as the slant of the road increases does the division of weight vary. Whether the right front tire wears faster than the right rear depends to a great extent on whether the front wheels are properly aligned or not. If the front wheel alignment is satisfactory then the rear wheels should wear faster than the front, due to the fact that they carry not only the weight of

the car, but the driving strain as well. For this reason under average conditions the right rear tire will wear out first and the left front tire last. Accordingly, to secure uniform wear from a set of tires, they should be changed around about

once a month. It is particularly important to reverse the rear tires and after the rear tires are worn down they can be reversed with the front tires. Note—The above facts were brought to the attention of MOTOR AGE by the Miller Tire & Rubber Co.

#### NEW YORK SHOW ISSUE

MOTOR AGE will greet its readers on the New Year with its big annual New York Show Issue which will be more interesting than ever this year because of the observance of the Silver Anniversary of the National Shows. And furthermore that issue will contain a lot of news about NEW CARS that can be obtained nowhere else in so complete a form. The New York Show Issue will be published.

JAN. 1, 1925

#### POPULAR RESEARCH NARRATIVES

A book containing stories of research and discovery has been published by William & Wilkins Company of Baltimore, Md., from data supplied by the Engineering Foundation 29 W. 39th St., New York. The book contains 50 short stories of discovery in the field of electricity, metallurgy and chemistry, and is of interest to all who appreciate the value of discoveries which have contributed to our civilization. Copies of this volume may be had from the Engineering Foundation for 50 cents.



# Those Strange Shapes

*Motor Car Body Designs Developed in Europe to Get Fuel Economy Would Be Called Freaks in America*

Motor car development in continental Europe has brought about some designs that are considered rather freakish by Americans. Among these developments the process known as "stream-lining" has been carried to an extreme unknown in this country. Because of the high cost of gasoline and high horse-power taxation the continental Europeans are interested in any new design that promises fuel economy and reduction in the size of engines required for given performance. It is claimed that stream-lining as shown in the accompanying illustrations so reduces wind resistance that great economy in fuel consumption is obtained. It does not seem that there is any necessity for such measures in America, but as a matter of interest to the trade the stream-line theory is expounded in this article.

By J. H. W. KERSTON

**B**EFORE beginning a description of stream-line motor cars, it might be well to explain what a "stream-line" really is. The word has been mentioned quite frequently of late, but very few people seem to have a clear idea of its meaning. Most of us have at some time or other observed the wonderful curves produced on the surface of water by an obstacle of some kind, a stone for instance, or the pillar of a bridge. And who of us, when idly trailing our fingers through the water when in a rowboat, has not observed the same phenomenon? These lines and curves which appear to be nothing in particular and the particles of which wash the obstacle, are stream-lines.

But what is the connection between all this and a motor car?

These lines deviate from the obstacle or body by which they are caused, according to its shape, and the closer the stream-lines can approach this body, i. e., the shorter the cut they have to take to it, the less will be the pressure on that body.

## Motor Car Displaces Air

Water flows away smoothly from a swimming fish with scarcely any friction, owing to their correct and rational lines. As a matter of fact, this friction is but one-twentieth or one-twenty-fifth of that caused by the displacement of an angular or circular block of wood floating at the same speed.

An automobile isn't a boat, but, like a boat, a motor car

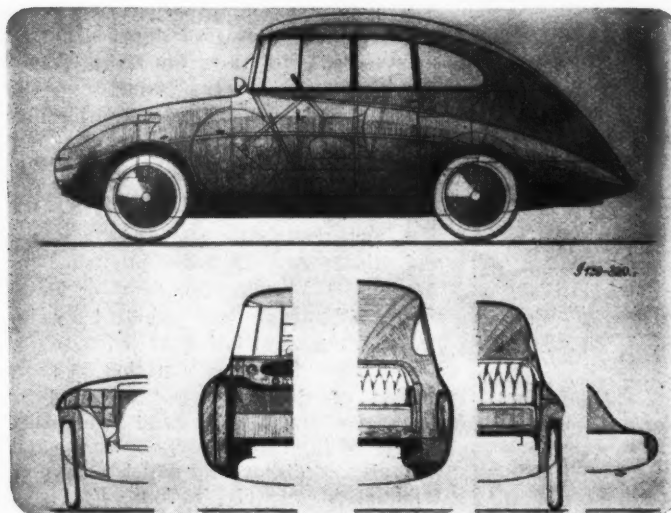
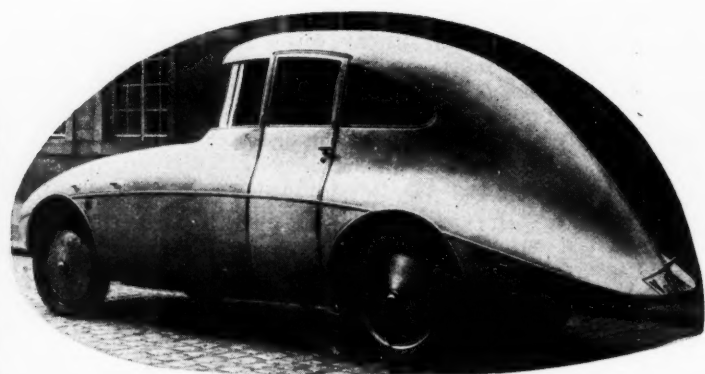


Diagram of typical Jaray stream-line body with sectional views



are Stream Lines

There is shown above a Jaray type stream-line body on an Audi chassis, an extreme of recent European development. The entire chassis is enclosed and the wheels also are set into the body so as to offer the least wind resistance

displaces a fluid environment, the air. And when air meets with an obstacle, it acts in exactly the same way as water does. Of course, it is true that air is nearly a thousand times less dense than water, but the surface presented to it by a motor car is almost a thousand times bigger than that offered to the water by a fish, and a car moves at a much higher rate of speed. Consequently, the reaction of the air on a running motor car is proportionally greater than that of the water on a swimming fish. Nature, who always follows the line of least resistance, has provided even the tiniest minnow with a form adapted to the stream-lines. But our modern, machine-driven vehicles, which have to overcome the resistance of the air, are always rectangular in shape.

Without exception, all automobile body shapes marketed today are scarcely more than a matter of fashion and hardly—if at all—take into account the lines of least resistance. Those bodies which seem best to "cut the wind," offer about the same resistance to the air, as a rectangular block. Mr. Jaray has written somewhere: "The air favors certain well-defined shapes to the exclusion of all others." Practice has proved that he is right. During the past 10 years he has contributed in a large measure to the improvement in the shape of dirigible airships which, from his point of view, show great superiority to motor cars. Yet it should be just as advantageous for the latter to reduce their fuel consumption and to make a more rational use of their motor power.

But is the question of atmospheric resistance after all so important for motor cars? Their great speed, compared with that of aerial crafts, is not great. The preceding remarks are practically an answer to this query. If nature herself finds it necessary to endow even a minnow with a "stream-line" shape, how much better would this be for the motor car, which displaces the air under far less favorable conditions than those under which a fish displaces water!

The wind resistance of an ordinary car going at 22 miles an hour increases by more than 60 per cent the power required to overcome the friction of the road wheels and the usual power transmission losses. At 40 miles an hour this figure is 90 per cent; at 50 miles the increase of energy required due to the air resistance is 110 per cent. These figures were obtained from tests made with modern cars, equipped with windshields, radiators, but without tops, luggage or luggage carriers, running boards, side or headlights or any other accessories likely to break the body outline.

## Stream-Line Body Result

Unfortunately for everybody concerned the motor car runs on wheels, which themselves offer almost as much resistance as the rest of the car. Hence all modifications applied to the motor car body would not, in the very best of cases, reduce the wind resistance by more than one-half. And in actual practice not even this modest saving can be effected. A car must have a body of some sort, however rudimentary it may be. And even if we could dispense with the body, the axles, brakes, rods and springs of the chassis would be exposed to the same full current of air, owing to the displacement of the



machine; and the resistance to these organs would almost entirely annul any reduction due to the suppression of the body. To instance an example: The front wheel axle of a motor car exposed directly to the air current, caused by the travel, offers a resistance equal to that of a stream-line body of the width and height of a complete car!

Having discovered this truth, Mr. Jaray saw that there was only one way of effecting a suitable saving, and that was to enclose as completely as possible all the organs of the car, including the wheels, in one stream-line body.

Does that suggest a sort of dirigible on wheels? By no means. An airship glides through the air, which surrounds it symmetrically on all sides. A body which displaces the air when traveling over the ground, must do it unsymmetrically. The greater volume of air displaced by a motor car should pass above it, while the air current near the ground must remain horizontal. The proximity of the ground led Mr. Jaray, after a careful study of the problem, to adopt a shape which resembled one-half of a dirigible, cut on the horizontal plane, and placed as near to the ground as possible. And so the stream-line body, as pictured here, came into being.

This means that when a car with a maximum of 16 h. p. is running at an average speed of 22 miles an hour, or when a car with a maximum of 40 h. p. is running at an average speed of 31 miles an hour, a saving of close to 30 per cent in energy is effected.

It is astonishing to note the great influence caused by a change of speed and wind resistance on the fuel consumption of ordinary motor cars. With the "stream-line" car, under exactly the same conditions, there is a considerable saving. The usual obstacles to fast travel, such as villages, official speed restrictions, detours, etc., compel the motorist to increase his speed considerably when he has an open road before him, if he wishes to maintain a reasonable average speed. In such cases he rapidly covers a great deal of ground at a speed during which the saving effected by a rational body runs into high figures (40 per cent, 50 per cent and even more).

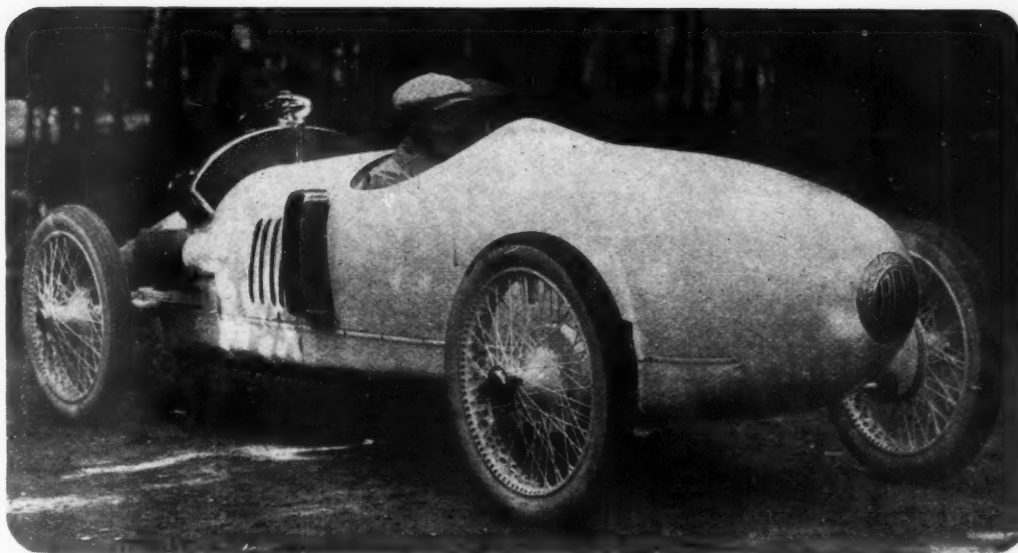
Interesting tests were made with a series of cars with identical chassis and motors, the only difference being in the bodies. One of the cars had a "stream-line" body, the others had various types of conventional bodies. It was seen—let us hasten to add—that all these normal bodies (one of which was enclosed) offered exactly the same wind resistance.

#### Details of Tests

These tests were made in two series. The first was intended to determine in what time a car coasting at a given speed, would come to a full stop. These cars were placed atop a slope, and at a given signal began to descend, with the motor stopped and the gearshift in neutral. The slope was approximately 960 feet long, then flattened out and ascended again for about 2500 feet. Of course, the profile of the road and the surface conditions had all been accurately determined beforehand).

During these 13 test runs the average speed of a normal Ley car was 15 miles an hour and the average stretch was 2,392 yards; the average speed of the "stream-line" Ley car was 18 miles an hour and the average stretch 3,337 yards. After having made exact calculations in order to point out the difference between the two cars, equipped with a normal and the special "stream-line" type of body, it was shown that the latter had an actual superiority of 68 per cent.

The second series of tests was devoted to the question of fuel consumption and was carried out in the usual manner. A receptacle, holding one quart of gasoline was used to feed the carburetor, and the car was driven on a hilly and curvey



*A Benz 2-litre racing car also a stream-line development. This car, built under Rumpler patents, has the engine in the rear and the occupants are seated well forward*

road until it stopped. At a moderate speed of 25 miles an hour, the saving in fuel consumption with the stream-line car was about 29 per cent, as against the identical chassis with a conventional body.

These official test reports conclude with the words that any car, equipped with a Jaray type of body, at the very moderate speed of 18 miles per hour, shows a superiority of approximately 60 per cent to the ordinary car.

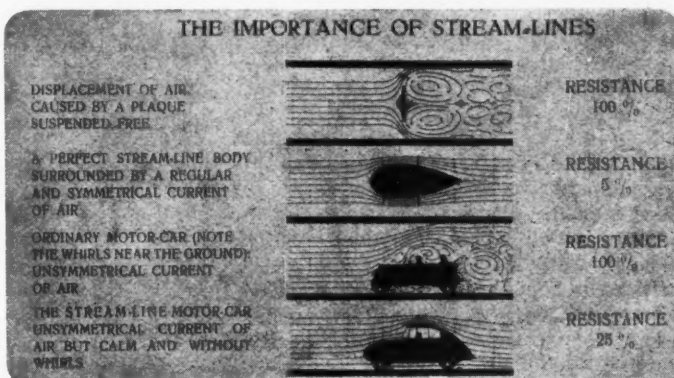
#### Smaller Motors Can Be Used

Taking into account the higher speeds attainable with the stream-line car, as well as its greater climbing ability, we find that, at an average speed of 26 miles per hour, a saving of 40 per cent in fuel consumption as compared with an ordinary car, is effected.

Mr. Jaray's system permits the use of much smaller motors than those at present employed. A lighter and smaller motor and the consequently smaller torque reactions on the transmission and the frame, forecast several advantages which may be expected from the use of this system.

The correctness of this stream-line design may also easily be proven by throwing little bits of paper out of the car and the course of the stream-lines may then be followed. The air displacement takes place almost horizontally at first, on the right and on the left of the carriage body, then it descends, following the lines of the car, and upon reaching the ground comes to rest very soon.

The same thing happens when traveling over a dusty road in calm weather. The clouds of dust, which are very slight indeed when compared with those raised by an ordinary car, hardly rise more than two feet above the ground and soon settle on the road again. This is partly explained by the fact that the wheels are almost entirely enclosed within the body.



*Graphic representation of how wind resistance is reduced by stream-lining*



Show Room of Capital City Auto Co. previous to announcement of new models

## "It Ain't Gonna Rain No Mo'"

*New Orleans Dealer Puts on Successful Campaign, Built Around the Idea Back of the Popular Song*

"MYSTERY, more than anything else, accounts for the appeal registered by our recent 'It Ain't Gonna Rain No Mo' campaign, used in introducing the Studebaker Duplex Phaeton to the New Orleans public," Fred Perkins, president of the Capital City Auto Co., said.

Mr. Perkins certainly made them wait through several days of suspense that was cumulative in its effect. The ease with which this car can be made waterproof was the thing that caused the Capital City's president to hit upon linking up the debut of the cars with the popular jazz refrain. The ideas back of the campaign could be used, however, in merchandising any kind of enclosed car.

When the windows of the show rooms suddenly revealed the title of this song, written in bold, red letters, a few days before Sept. 14, the public scented mystery. Soon the date, Sept. 14 appeared along with the title of the song. Storm canopies were used to connect the two entrances of the show rooms with the street. Then a few days before the ap-

pointed time for the ringing up of the curtain on the final act, a veiled car was placed on a truck with the title of the song on the side, and motored slowly through the streets.

At the same time three models of the new cars made their appearance in the windows of the Capital City, but they were shrouded from view. Simultaneously, a number of umbrellas were secured and parked along the glass just

inside the windows, and several of them were opened and hung from the chandeliers while others were placed on the veiled cars and on the floor of the display rooms. On Saturday before the unveiling of the cars occurred that night, a guard was maintained around the new cars all day. Then with appropriate ceremonies the paper wrappers were removed from the cars as people streamed into the store to see the new models.



Refrain of a popular song on show window attracted interest to forthcoming announcement



# Some Late Developments in the Automotive Industry

**A** NEW automobile surface finish said to cut finishing time in half and which possesses important resistant qualities has been developed by the Zapon Co., New York. The new product, called Zapon, composed largely of pyroxylin, is declared to be unaffected by climatic conditions and to withstand sunlight and salt water and the effects of rain and, snow, ice, grease, alkali dust, boiling water, gasoline, battery acid or ammonia. It is a very hard finish and will resist considerable bumping and scratching. It can be easily washed off, leaving the lustre better than before.

A saving of up to 18 days in finishing time has been recorded in actual practice with the Zapon finish, it is stated. Being a solution of pyroxylin compounds, it is applied with an air brush and it dries very quickly. Any shade and color may be obtained.

Schools have been opened by the Zapon Co. in New York city, Chicago and Los Angeles, where men are being trained in the application of the new finish.

## Rawlings Has New "Press the Button" Type Window Lift

The Rawlings window lift for closed cars is in the form of a press-the-button type. Slight pressure on the button is sufficient to raise the window rapidly. Another new type employs a decorated loop or lever which matches the interior hardware. The loop is raised slightly to close the window and lowered to lock the window in any desired position. The principle of the Rawlings lift is quite

simple, being basically like that of a roller shade, which is to say, a spring-loaded roller supplies the energy to raise the window. Two rubber cushions or bumpers hold the pane firmly in any position and prevent any possible damage due to vibration, it is stated.

### BOOKLET ON TIME PAYMENTS

A booklet entitled "Time Payment Common Sense" has been published by Dodge Brothers of Detroit, outlining to Dodge Brothers dealers various methods and processes of selling automobiles on time payments. The booklet sets forth briefly some fundamental principles which should be observed in the safe conduct of a time payment sales business. The first of these principles is that the dealer should be certain that the credit risk is entirely satisfactory and should bear constantly in mind that no time payment sale is complete until the last payment is made.

Another principle is that the down payment should be large enough, and the deferred payments frequent enough and of sufficient amount so that the value of the car at all times will be substantially greater than the unpaid balance of the purchase price. The booklet recommends that the dealer should always indorse time payment papers for re-discount, because in that way he is able to obtain the necessary credit on more reasonable

terms for his customers, and also the continued interest which the dealer has in the transaction makes him more careful in the investigation of credit risks.

The booklet states that a comparison of the percentage of time payment sales made by Dodge Brothers with the percentage made with the industry as a whole indicates that Dodge Brothers' dealers do not use time payment plans as extensively as it would seem they should. It is stated that the percentage of retail deferred payment sales by Dodge Brothers' dealers is only three-fifths of the estimated percentage of such sales over the industry as a whole. The booklet contains practical suggestions for the investigation of applicants for credit, for protection by insurance and for collections.

### NEW BOOK ON ALUMINUM

A new book on the metallurgy of aluminum and aluminum alloys by Robert J. Anderson, B. Sc., Met. E. published by the Henry Carey Baird & Company, Inc., 2 West 45th street, New York City, has recently appeared. It covers the subject of aluminum and its alloys from the time it is taken from the ground until it is used as a finished article. It is written from both a theoretical and practical standpoint and should be of interest to automotive and mechanical engineers. The price of the book is \$10.

## 25 Years Ago In the Automobile Industry As Recorded In MOTOR AGE

(From MOTOR AGE of Dec. 21, 1899)

### Omnibuses for Boston

BOSTON, Mass., Dec. 17.—Motor omnibuses running through Boston streets will be a common sight within a few months, as the board of aldermen has just granted locations petitioned for by the company behind the measure, known as the Boston Transit Co. The president of the company is Benjamin D. Hyde, a well-known lawyer of this city, and some of the stockholders are Hon. M. M. Cunniff and Col. Albert A. Pope of the Columbia and Electrical Vehicle Co.

### Automobile Tour

A grand tour of 1100 miles for motors of every description has been organized in London in order to place the automobile and its capabilities before the public in a manner at once interesting and practical. The tour will be from London to Edinburgh and will take place next March. The route will be a zigzag one, in order to attract the general attention of the country. There will be nine one-day exhibitions at the same number of important provincial towns en route, and gold, silver and bronze medals will be awarded as prizes.

### Washington Restrictions

WASHINGTON, Dec. 16.—In view of the increasing use of automobiles in this city, the District Commissioners have deemed it wise to place them in the same category with bicycles, so far as speed limitations are concerned. An order to this effect has been issued and hereafter the speed of these vehicles will be restricted to 12 miles an hour within the city limits and 15 miles an hour outside the city limits.

### International Cup

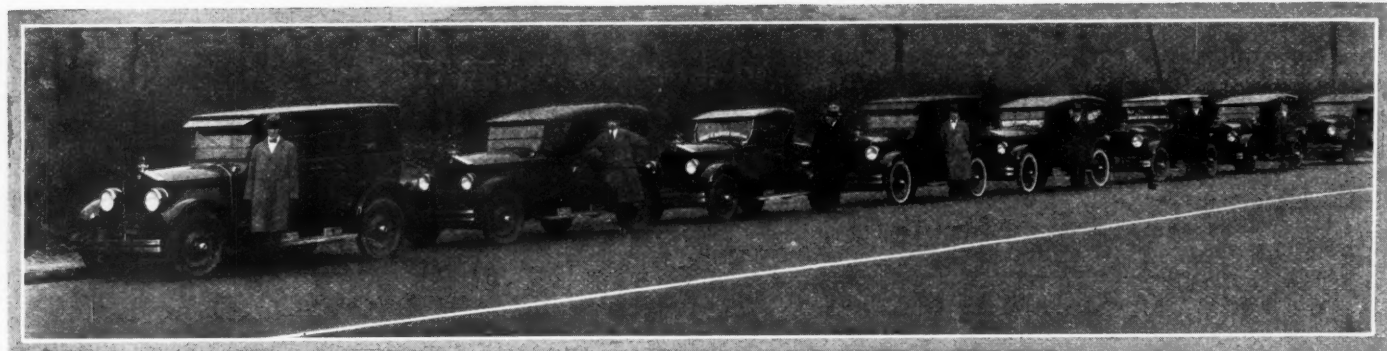
NEW YORK, Dec. 17.—The Automobile Club of America will hold a meeting this week to decide upon the question of representation of the International Cup Race to be held in France next year. Entries must be in the hands of the entry committee in Paris by Jan. 1 and will be accepted from only one club in each country, each club being confined to a representation of these vehicles. Alexander Winton has declared his willingness to enter the contest and to post the necessary \$600 forfeit, and from the present outlook there will be at least one other maker who will enter.



Pressing a centrally located button operates the window in the new window lift made by the Rawlings company



# MOTOR AGE'S PICTURE PAGES



**TAKING THE SHOW TO THE DEALER.** No two cars in this procession are alike although all are of the same make. This caravan of Moon automobiles is driven from place to place by G. F. Reed Motor Co., distributor at Pittsburgh, Pa., so dealers and the public in small towns may conveniently view a variety of the models offered by the Moon Company. The plan has been a great success

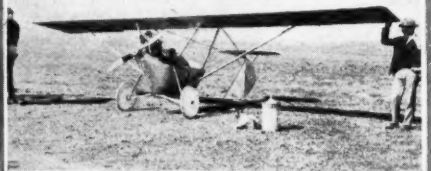


**PERU ADOPTS FIRST SEDAN-TYPE BUS.** This is the first vehicle on modern lines to be operated in the thriving South American country. It is a Republic Model 80 and runs between Callao, the seaport, and Lima, the capital. It has proved very popular with commuters between the two cities—so much so, in fact—that additional buses will be used



**C. W. NASH RETURNS WITH BIG GAME.** C. W. Nash, president of the Nash Motors Co., Kenosha, Wis., returned recently from an extended hunt in British Columbia well laden with trophies. All of the animals are fine specimens and Mr. Nash plans to have them mounted

1st. E. Dormoy's "Bath Tub"  
Henderson Motorcycle Engine



2nd. J. M. Johnson  
Henderson Motorcycle Engine



H. C. Mummert  
Harley-Davidson Motorcycle Engine  
forced landing, out of race.



**SMALL PLANES PERFORM WELL AT DAYTON.** The competition of small aircraft at Dayton recently for the Rickenbacker trophy showed what could be done by the use of motorcycle engines in the construction of one-man planes and suggests the possibility that some day there may be as many planes in the sky as there now are Fords on the ground. Speeds as high as 90 miles per hour were obtained and they were easily maneuvered. The trophy was won by the so-called "Flying Bath Tub," built in a cellar in Dayton by E. Dormoy. It looked like a motorcycle side car and had a Henderson engine mounted in front, the pilot sitting in the "tub" with monoplane wings supported above, and an outrigger tail about 10 ft. to the rear

# OF AUTOMOTIVE INTEREST



**FILLING STATION THAT PULLS BUSINESS.** It is that of the Skylark Oil Co. of Cedar Rapids, Ia. The blades of the mill wheel are revolved slowly by a motor inside the tower. The design is such that the attention of tourists is attracted at considerable distance from the station



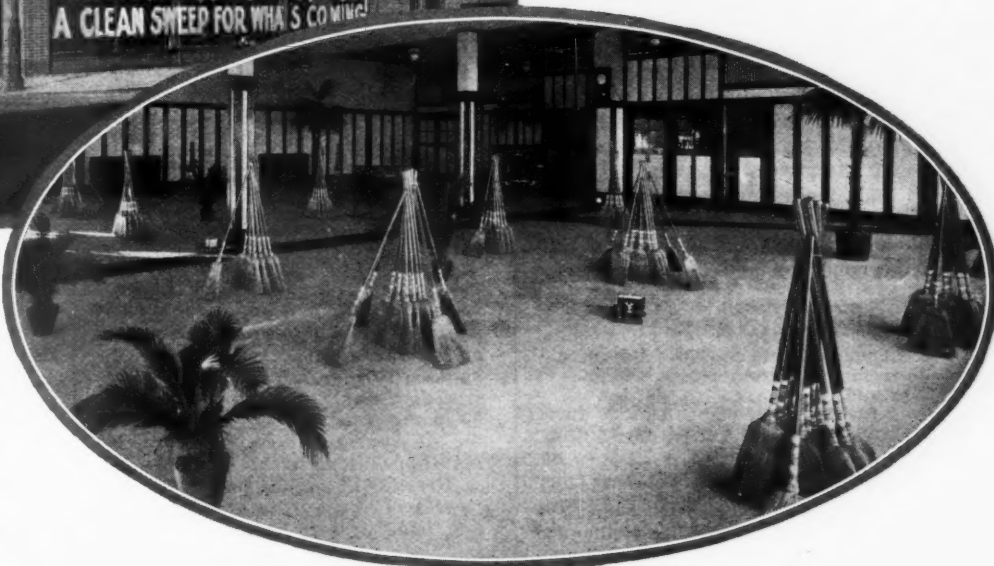
**A DIFFERENT APPEAL** Japanese architecture is featured in this Los Angeles filling station, one of Andrew Panshini's Savoy Auto Park System.



**BEAR MOUNTAIN BRIDGE OPEN.** The Bear Mountain bridge across the Hudson from a point near Peekskill, on the east bank, to the west bank at a point near Bear Mountain, was opened to the public recently. Its completion opens a new motor highway to the west. It is the only highway bridge across the Hudson south of Albany and has been under construction for more than a year. Elaborate opening ceremonies were held. New Yorkers christened the new structure with a steady flow of vehicular traffic. Note the four rows of cars.



**READY FOR A CLEAN SWEEP.** When the Davey Marmon Co., Des Moines, Ia., received word that the new 1925 Marmon was on its way, they stripped the sales floor bare and borrowed a large number of brooms from a local manufacturer. These were arranged in stacks and displayed in the windows. Big signs on both front and side of the windows read: "A Clean Sweep For What's Coming"





# The READERS' CLEARING HOUSE

## Questions & Answers on Dealers' Problems

### Cost of Charging With Tungar Rectifier

Q.—Would it cost more or less to charge four 6-volt batteries by using two 2-battery tungars or by using one 4-battery tungar? Also what if any, is the difference in charging two batteries on a two battery tungar or charging two batteries on a ten battery tungar.—Painter's Garage, Darlington, Indiana.

The efficiency of the small tungar rectifier which charges either one or two 6-volt batteries is about 28 per cent. The efficiency of the four battery tungar when full loaded with four 6-volt batteries is about 55 per cent. The efficiency of the ten battery tungar when there are only 2 batteries on charge is 45 per cent. Giving complete figures on the ten battery tungar we find that the efficiency when charging one battery is 30 per cent, charging two batteries 40 per cent, charging three batteries 53 per cent, charging four batteries 60 per cent, charging five batteries 63 per cent, charging six batteries 66 per cent, charging seven batteries 70 per cent, charging eight batteries 72 per cent, charging nine batteries 74 per cent, charging ten batteries, 75 per cent. The cost of charging will of course go down as the efficiency goes up.

### WHEN THE DRY CELL GETS WET

Q.—Please furnish a diagram of the internal circuit of late Ford generator. Also state the cause of dry cell battery on which at the present time moisture comes out on top.—Montana Subscriber.

You will find this diagram given on page 26 of the October 30, 1924 issue of MOTOR AGE in the left hand column. The right sketch in Fig. 101216 is the one you want.

Dry cells are really dry only on the outside for they have to be moist inside in order to operate. Moisture coming out of the top must be due to a crack in the sealing compound. Another thing which will make moisture come out is to have a short circuit on the dry cell or a very heavy current flowing from it for a considerable time. This apparently causes enough internal heating to crack the cell and make moisture come out. We have seen dry cells which were short circuited and which would burst the sides due to the condition above described.

### HOW TO REMOVE UNIVERSAL JOINT

Q.—Will you tell me how the Universal joint is removed from an Overland 4? The Overland 4 referred to, is the car known as the Model 4, comprising a unit power plant with the Ford type oiling system.

Disconnect the brake rod, removing the rear axle assembly which will slide off the Universal joint housing extension. When this is done you can then unbolt

### The Readers' Clearing House

**THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.**

**All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.**

**Readers' names will not be published with articles, if a request to this effect is received with the letter.**

**Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.**

**Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.**

**Addresses of business firms will not be published in this department but will be supplied by letter.**

**Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.**

the Universal joint housing at the end of the transmission and remove it complete.

2.—Can you supply me with a copy of Motor Age given out last fall which contained cut of the Dodge steering gear. Would like very much to have it as my copy has been destroyed by fire. It seems to me it was the Winter Service Number.

We are forwarding to you the issue in question.

3.—Does a five brush Simms Huff Maxwell generator control output in the generator itself as in a 3rd brush system?—R. H. Oswald, Frost, Minn.

Yes.

### INDEX

of Readers' Clearing House

**HEREAFTER the index of the Readers' Clearing House Department of MOTOR AGE will be published once a month, in the first issue of each month covering the material published in the weekly issues of the preceding month. The next index will be in the issue of Jan. 1, 1925, covering the contents of the Readers' Clearing House Department in the issues of Dec. 11, 18 and 25. Look for the Readers' Clearing House index in the first issue of each month.**

### Starter May Fail Due to Commutator Flat Spots

Q.—In the Readers' Clearing House of September 4th, there was a question asked by the W. R. Moore Garage of Benjamin, Texas, regarding the failure of a starter on a Chevrolet to function when armature has come to rest in a certain position. We have had many such cases and in addition to the causes set forth by MOTOR AGE wish to suggest a close inspection of the commutator for "flat spot." The armature of a starter with a Bendix drive will invariably stop in the same position each time. This means that the armature will start from that position which results in a burnt or pitted condition at certain spots on the commutator, the copper segments wearing away at these points so as to make the commutator egg shaped. The remedy is to true up the commutator by taking a light cut in a lathe.—R. S. Browne, Chicago, Ill.

MOTOR AGE is very grateful for this suggestion and will forward it to the Moore Garage of Benjamin, Texas.

### WHAT CAUSES KNOCK

Q.—I have a Studebaker light six. It has not been run hard or been on long runs. When this car speeds up to 25 miles an hour a knock develops. It can be heard only at a speed of 25 miles an hour and if it is pulled hard it will not show up.—Herschel Wakefield, Couden, Ill.

We are of the opinion that the noise is due to a loose connecting rod. For further information regarding the location of the knocks and their elimination we would suggest that you refer to the May 22, 1924, issue of MOTOR AGE which on page 17 gives a reference guide for the elimination and diagnosis of most abnormal engine noises.

### CASE TIMING

Q.—Please send me the correct timing for a J. I. Case Model R serial number 27053 T. head motor and oblige.—W. N. Gilberd, Box No. 708, Casper, Wyo.

Although your information is very meager we assume it refers to the Model R engine, built in 1914. If the engine in question has a bore of 4¼ and a stroke of 4¼ the timing should be set so that the exhaust valve closes seven degrees after upper dead center.

### A MILLER JOB

Q.—Is the Studebaker special being driven by Earl Cooper a complete Harry Miller job or is it just equipped with a Miller motor?—Jasper T. Gibson, care Hudson Essex Sales Company, Laurinburg, N. C.

The Studebaker special being driven by Earl Cooper is a complete Harry Miller job, originally built by him, raced under the name of the H. C. S. and now under the name of Studebaker special.



# The Readers' Clearing House

## Two Story Automotive Store With Large Service Department

Q.—We are going to build a garage building and notice that you can assist us with plans. We have the following departments: sales, service for about ten mechanics, parts and accessories and storage. We attach hereto sketch of our plot of land which is 75 by 150 feet and on a corner. Our sales amount to about one hundred new Buick cars a year and about the same amount of used cars.—Salisbury Motor Co., Salisbury, N. C.

We have laid out a building which is somewhat unusual but which we believe would be quite well suited for your use. The first floor is arranged to take care of sales of new cars, accessories and parts, as well as the storage of 30 cars. A small place is also indicated for quick service which will take care of two cars or will serve as storage space for three cars. A ramp leads to the service department and storage space on the second floor and a large stairway serves customers and salesmen who wish to visit the used car showroom directly over the new car showroom on the main floor. The general office is also located on the second floor, the space on the main floor being devoted to sales only.

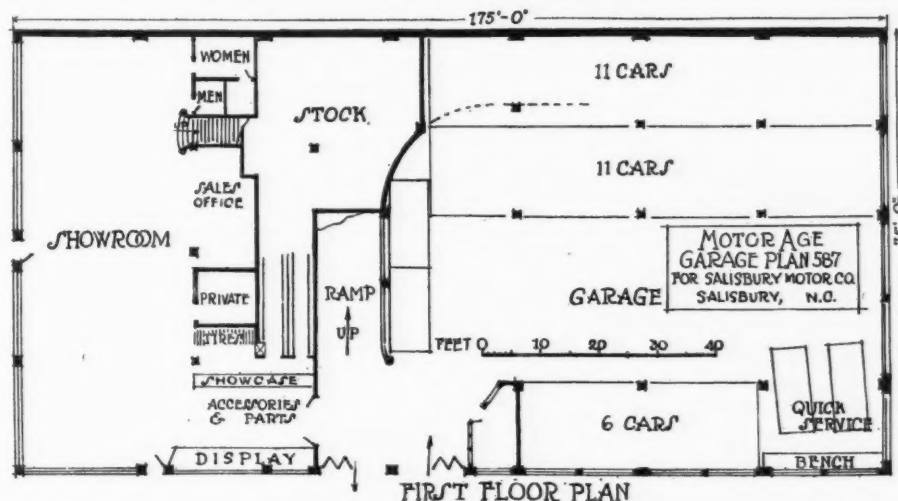
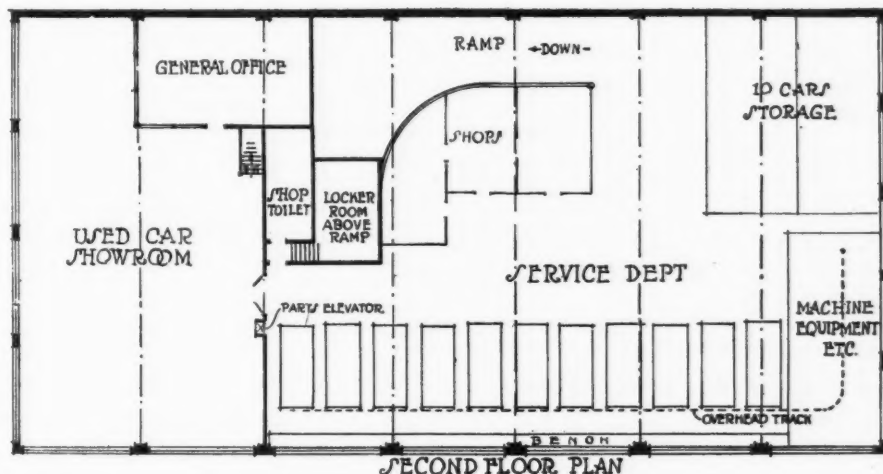
We have devoted considerably more space to the service department than could be utilized to advantage by 10 men, but the whole rear end could be used for storage if desired—either storage of new cars or of customers' cars.

Of course it would be better to confine the storage to the first floor, then there would be very little interference in the service department, and it would be worth while, if storage is handled on the second floor, to build a partition across the entire floor, starting at the top of the ramp and extending to the windows on the side in order to separate the two departments.

There seems no good way of installing a straight ramp, though this is to be regretted, without making a double entrance in front. This would cut down the showroom frontage considerably and we would prefer the arrangement we have shown unless there are objections to using the side street.

The side entrance tends to separate the sales and service to a great extent and makes a good opportunity to introduce the accessories department, where customers of the garage and service department are going and coming.

A parts elevator may be used to convey parts and accessories from the stockroom to the shop. This avoids the necessity of having a shop stock which is always



more or less incomplete. It also keeps the stockroom on the main floor in space that is not well suited to any other use.

If another stairway is desired it could be arranged in the angle of the ramp.

### THE RESULT OF A WRECK

Q.—We picked up a wreck car with the front of chassis and steering gear smashed and bent up. After putting the car in as good condition so far as could be seen, it was taken for a test, when it was just a short distance from the garage it jumped off the road and hit a tree causing a wreck. We understand that we cannot be held responsible as the car had already been wrecked and we were doing our best to recondition it.—North Carolina Reader.

If you can show the facts as in your wire you cannot be held responsible.

Ordinary negligence resulting in injury to another or to his property is a question of fact, ordinarily, for the jury. The garage keeper is only required in making repairs to exercise the skill and care of an ordinarily prudent and ordinarily skilled repairman skilled in the same business. You say you put the car in "as good condition so far as could be seen." Now if you mean "so far as could be seen" by an ordinarily skilled repairman in your line of business, then you have done your duty. But in case of contest you will have to prove that as a fact. The burden is upon you to show this.

Needless to say, you could not be held responsible for damages from the first wreck, and, if at all, only for additional damages resulting from the second wreck.

### Architectural Service

IN giving architectural advice, **MOTOR AGE** aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

# The Readers' Clearing House

## Car Doesn't Climb Well

Q.—I have a 1920 Willys-Knight, model 20 which has pickup, getaway, flexibility and all the rest of it—but it won't climb well, and it runs decidedly hot, which is very unusual in a Knight motored car. While the motor is still cool after starting it pulls very well, but when it warms up, not so good. Cylinder walls of inner sleeves are in perfect shape, rings are good with no signs of blowby. Compression seems to be about the same as the average Knight. I have tried various settings of the plug gaps, filed and set the breaker points, checked the valve timing by ports and by flywheel marks. Experimented with float level, got spare high speed jet, and tried changing opening. Got all sorts of interesting results, but no power and no cooler running. Tried your test—given in September 26 issue of using trouble lamp across battery terminals, and from coil to frame. Light that was bright across terminals, was much weaker from coil to frame, so I tried bridging the automatic spark cutout which has a resistance in it. This made quite a difference in the brilliancy of the light, coil to frame, but it made no slightest particle of difference on my pet test hill. I have tried every conceivable spark setting, brakes do not drag, clutch does not slip and the motor starts in one revolution when hot. Motor is rather hard to start if very cold, but mainly on account of the drag of the sleeves—starter don't turn over very fast at any time. A rather wide setting of the plug gaps—.032—gave me a strong idea that the trouble was in the ignition. With this gap, the car ran perfectly on the level, but on a medium pull, had no power at all, although the motor did not miss. Evidently there was compression enough to thin out the spark, and if compression is not good, then the spark must also be weak. The whole trouble seems to me to be tied up with the relation of spark strength and compression. In the open air the spark jumps about  $\frac{3}{8}$  of an inch, but will not jump farther which does not strike me as being any too good. Spark color pale blue with no red in it. Radiator hose is new and the radiator has been flushed with lye twice with no change in the overheating. This car gets about 18 miles to the gallon around town and about 22 miles per gallon on a run. Maximum speed that I have driven it has been 60 miles per hour; I think it might possibly do 65 with the top down. On level ground or slight grades am equal to some of the best, but when the grade gets steep the flivvers go by me in high with ease, while I have to run in second. There is some carbon in the motor now but not enough to be very noticeable as it only pinks on a slow pickup in high and not on a pull. Plugs burn clear and throttle opens nearly all the way. The car pulls slightly better at times, but this might be due to variation in the quality of gas. Did the Willys factory ever put out a Knight motored six?—W. W. Clendenin, 1417½ Sunset boulevard, Los Angeles, Cal.

Your letter contains things that are absolutely contradictory to all that we have ever been taught about the behavior of automobiles. We are therefore going to forget all about logic and theory and make the following suggestions; First disconnect the regular gasoline supply system and mount a one quart or better still a two quart or one gallon can above the carbureter. Connect the bottom of this to the float chamber and run

the car by filling this tank with gasoline so as to give a straight gravity feed unaffected by the present fuel supply system. Try the car on a hill and see if it has more power than previously. If the test just outlined above gives you no better results, disconnect the exhaust pipe at the muffler and try the car and see whether any greater power is gained. If there is a noticeable gain in power it is sufficient proof that the muffler is obstructed with carbon or internally deranged. See that all of the exhaust ports are clean which of course can be detected by removing the exhaust manifold. Set the spark plug gaps to not more than .022. Our hunch on the test outlined in the first paragraph is that the flow of fuel to the carbureter is decreased when the car is at an angle with the horizontal. We are basing this fact on your statement that the car will do 60 miles an hour on the level. To do 60 miles an hour requires considerable power and we believe that it is some slight thing such as an insufficient supply of fuel to the carbureter that is causing the loss of power on hill. As this is a very unusual case we would appreciate hearing from you regarding the success or failure of our suggestions.

## BILL FIXIT

Electrical Expert

*In the next issue of MOTOR AGE this old friend of our readers will hand out another liberal batch of sound and sensible instruction on the maintenance of the automotive electrical system, through the fluent pen of A. H. Packer.*

## NEXT WEEK

## How Much Saving With High Compression Head?

Q.—We operate a Ford truck and would like to know whether we would save much gasoline if we would replace the present cylinder head with a high compression old style Ford head.

The old style head which gives high compression is not suitable unless either benzol or gasoline treated with anti-knock material is used. With the regulation gasoline the engine will knock when pulling. The benzol or treated gasoline however, reduces the tendency to knock when on a heavy pull with high compression. It accordingly makes the engine somewhat more efficient but we can hardly predict an exact saving. Also as the fuel is somewhat more expensive than the regular gasoline it is again a question whether the saving in gasoline would pay for the increased cost or not.

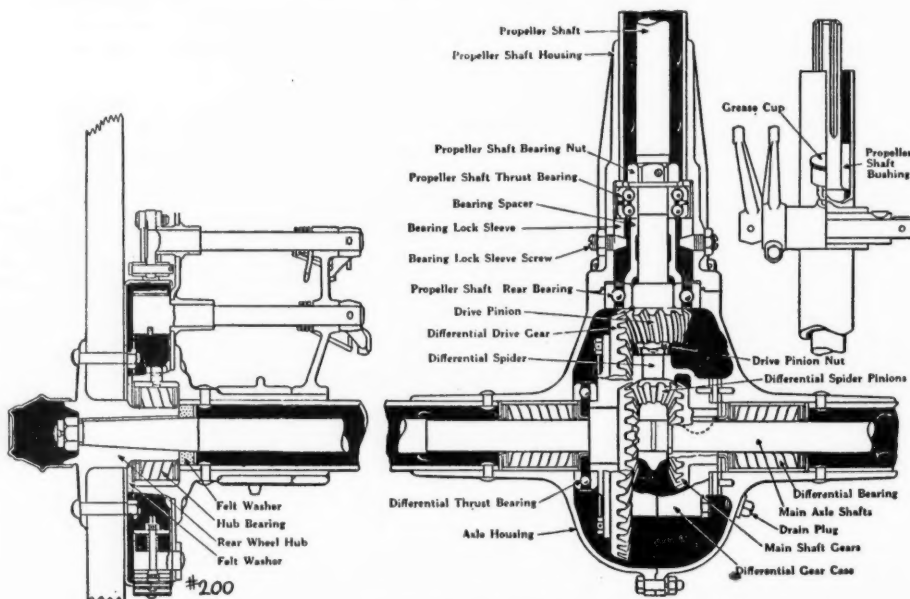
2.—Would also like to have your opinion about aluminum pistons as to whether it would be well to use them in this Ford truck.—L. M. Schwemle, Forestburg, S. Dak.

We can hardly recommend any particular make of piston but believe that in truck service cast iron pistons are more commonly employed. The type of piston used as standard equipment is usually the one which the engineer has found most desirable, and service stations often show wisdom by following the factory recommendations.

## CHEVROLET REAR AXLE

Q.—Please send me illustration of Chevrolet 490 rear axle and drive shaft.—Rapidan Garage, Rapidan, Va.

The illustration requested is shown at Fig. 200.



Chevrolet rear axle

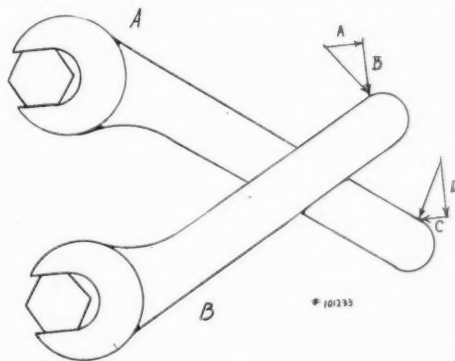


# The Readers' Clearing House

## The Right Way to Use an Open End Wrench

On page 28 of the November 13, 1924 issue of *MOTOR AGE* there was a sketch showing two ways of using an open end wrench which had the handle offset at an angle of 30 degrees. In the answer the only point brought out was in regard to the strain on the jaws.

An important point overlooked was called to our attention by Mr. Herbert Chase, Engineering Editor of Automotive Industries. This is the fact that one way of using the wrench involves danger of the wrench slipping off of the nut while the other method of using the wrench tends to hold the wrench on the nut. We are accordingly showing the sketch over again with the forces re-



solved into their components. For example the force acting on the handle of wrench B is the equivalent of a force A acting direct to the right and another force B acting directly downward. In the same manner the force acting on wrench A would be the same as a force C acting directly to the left and a force D acting directly downward. This shows that with the wrench in position B there is a tendency for the wrench to be pulled off of the nut while with the wrench in position A there is a tendency for the wrench to be held on the nut. In practice the wrench would be used either way in tight corners where but little movement is available, but if plenty of room is available position A is preferable. The tendency to slip off is of course neutralized to some extent by the friction of the wrench jaws on the faces of the nut.

### TRYING TO FILL A BIG ORDER

Q.—Please advise where I can find information as to the maximum compression pressure of all automobile motors. It is possible that you have published this information in some issue of the *MOTOR AGE* to which you refer us.—Shock Independent Oil Company, Mount Joy, Pa.

We have never printed the information requested. You will find however in the annual statistical issue of Automotive Industries, published by the Class Journal Company, 239 W. 39th street, New York City, that the compression ratio of all automobile engines

is given. This compression ratio gives a fairly accurate idea of the actual compression but is not 100 per cent accurate as the actual pressure will vary slightly from the theoretical pressure figured by multiplying the ratio by the atmospheric pressure. We would suggest that you communicate with Automotive Industries who no doubt can give you further information regarding this.

### COMPRESSION RATIO AND RACE CAR GAS MILEAGE

Q.—When you have the compression ratio given and the number of cubic inches how can you find the compression?

It is not necessary to know the cubic inches, merely multiply the compression ratio by 14.7. The value 14.7 is the atmospheric pressure at sea level due to the layer of air resting on the earth. The actual compression obtainable in the engine will vary from this figure with different conditions of running. Due to the fact that incoming gas from the carburetor to the cylinders has some inertia it will practically always be found that the actual compression is less than the calculated compression.

2.—What is the highest compression at present used on any passenger car?

From one of the specification tables in the February 21, 1924, issue of Automotive Industries we find that there are three passenger cars all of which have a compression ratio of five, which would give a theoretical compression of about 73.5 pounds per square inch. These cars are the Duesenberg, National, and Oakland. While five seems to be the maximum compression ratio used there are quite a number of other cars in the table which have compression ratios in the vicinity of 4.8 and 4.9.

3.—Which is best, an overhead cam or a cam on the side for engines having valves in the head?

This is probably a matter of personal engineering opinion. However, when the camshaft is mounted over the valves, there are less reciprocating parts and the weight of the reciprocating parts is accordingly less.

4.—How much gasoline does the Miller racing engine use?

About .6 pounds per B. H. P. (brake horse power.) When in a race these cars make about 10 miles to a gallon of gas.

5.—Where can I get additional information about these engines?

From the Miller Engine Works, Los Angeles, Calif.

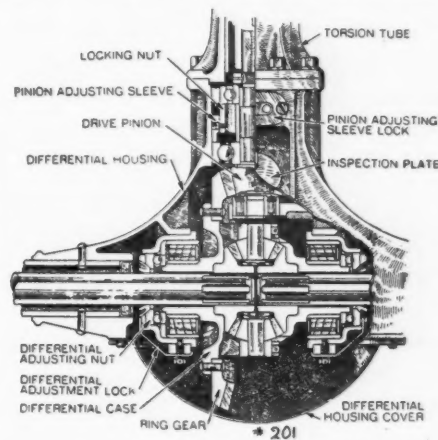
6.—With an engine of small bore can you use a higher compression than with an engine of large bore.—C. L. Carson, 1302 Franklin street, Waco, Texas.

Yes, practice seems to show that with a smaller bore engine running at very high speed the frequent charges of cool gas coming into the cylinder seem to hold the heat down to the point where detonation does not take place. The limit of the compression is the temperature at which the gas fires spontaneously and we have what is known as detonation.

## How to Adjust Pinion and Ring Gear for Backlash

Q.—Please send instructions for adjusting pinion and ring gear for backlash on the model F Mitchell 1920 or 1921.—J. C. Harper, 1217 N. 26th street, Birmingham, Ala.

For your guidance in making adjustment we are showing an illustration of the rear axle assembly at Fig. 201. The pinion is moved into or out of mesh by turning the pinion adjusting sleeve. Turning the adjusting sleeve to the left as the operator faces the front of the car moves the pinion into mesh. The ideal adjustment is obtained when the two gears, that is, the pinion and ring gear mesh along the full length of the pitch line of their teeth and the back faces of the teeth are flush with just a few thousandths backlash. Before locking the adjustment it should be checked by revolving the ring gear a few times



to be sure that none of the washers have moved out of place to give a false adjustment.

Moving the ring gear to the right or left to increase or decrease the backlash is accomplished by turning the differential adjusting nuts after they have been unlocked, all of which becomes plain when you refer to the illustration shown at Fig. 201.

Q.—What make rear axle, universal and transmission was used on this car?

The units mentioned were manufactured by the Mitchell Motors Company, Inc., Racine, Wisconsin.

Q.—Should a Borg & Beck clutch be washed out with gasoline to stop grabbing?

If the clutch is inclined to grab, remove adjusting screw and pour one-half pint of kerosene into it. Let the motor run for one quarter of an hour and drain the clutch by letting car stand over night with the front wheels at a higher position than the rear wheels. After this is done squirt a little oil into the clutch, just enough to moisten the asbestos mats.

# The Readers' Clearing House

## Must Follow Lien Law Strictly to Obtain Benefit

Q.—If I repair a customer's car and he takes the car out and agrees to pay at a certain date and fails, can I go and take the car and hold it for the repair bill?—R. H. Oswald, Frost, Minn.

Your state gives a lien to whomever performs or contributes any labor or skill, or furnishes or contributes any machinery, supplies, materials or storage in making, altering, repairing storing, or otherwise caring for any motor vehicle. If there be an agreed price, then the lien shall be for that sum otherwise the lien shall be for the reasonable value of the work, materials or storage.

But this lien is good only for 60 days, unless before that time a statement of the claim be filed for record with the township clerk, city clerk, or village recorder where the owner of the car resides. This statement must be verified by the oath of the lien claimant, or by some other who knows the facts stated, and shall set forth:

1. The name of the person claiming the lien, and notice of intention to claim and hold a lien;
2. The name of the owner or the reputed owner of such motor vehicle;
3. The license number of such motor vehicle; if licensed under the laws of the state of Minnesota;
4. The amount claimed to be due, and that such amount is due for labor performed, or machinery, materials, supplies, or storage furnished to the owner of the motor vehicle, or at the instance of an agent of the owner;
5. The dates when the first and last items of the labor, or other contributions are made.

The 60 day period starts with the furnishing of the last item of such labor, machinery, supplies, materials, or from the termination of such storage.

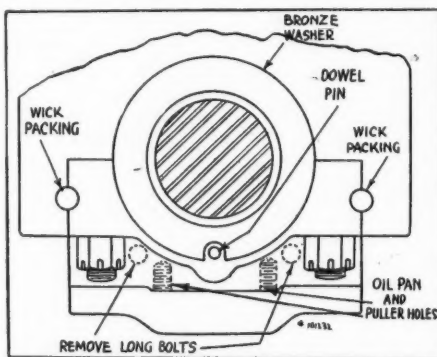
In one case it was held that the garage-man was not entitled to a lien for supplies, where he had furnished a number of tire casings to a taxicab business, unless at time the casings were sold they were furnished for particular cars.

The lien here given may be foreclosed by action within six months after the statement is filed. A complaint is filed with the clerk in the court in which the action is commenced, and shall contain a notice that the action is brought to foreclose a lien, giving the amount thereof, and the license number of the car affected. If the claimant recovers judgment, the court shall order the sheriff, or officer, to seize such vehicle and sell same at public sale in the manner provided for the sale of personal property under execution.

Here you have the law succinctly stated, it being necessary to file claim within 60 days. It is also necessary to foreclose within six months.

## CORRECTION ON JORDAN MAIN BEARING ADJUSTMENT

On page 51 of the November 6, 1924 issue of MOTOR AGE was an article entitled adjusting Stromberg on 1917 Jordan. The second question in the same article had to do with the removal of the front main bearing cap. Information given was to the effect that the front cover of the timing gear case should be moved forward about  $\frac{1}{8}$  inch after which the bearing would be free to come down. In general, this is correct. One of our subscribers however, Mr. Clarence Preston of Jacksonville, Ill., has called our attention to the fact that cylindrical wick packing is used in this bearing to prevent



Adjusting Jordan main bearing

oil leakage and the packing is so located that if it is not first removed it makes the job taking the cap off very difficult for the downward motion of the bearing cap would shear the packing in two. A sketch is shown to illustrate this condition. The proper procedure is to drop the oil pan of the engine and then jack up the engine so that it no longer rests on the front support. This is necessary in order that the front gear cover which integral with the starting crank housing may be loosened. The front gear cover should then be loosened both from the engine and from the frame of the car and the two long bolts which go into the bearing cap should be taken out. The next step is to use a crocket needle or other similar device with a sharp hook on it and remove the wick packing shown in the illustration. The nuts may then be removed, which hold the bearing cap in place. If the cap does not drop a puller may be used, the bolts of the puller going in two of the holes from which the oil pan screws had been removed. If the wick packing is not removed it is difficult to get the bearing out as would be evident from the sketch, while if the front gear cover is not loosened it will be impossible to pull the bearing cap down due to the two long bolts being screwed into it and also on account of the gear cover overlapping the bearing cap by a slight amount. Moving the gear cover forward about  $\frac{1}{8}$  in. is also necessary to withdraw the dowel pin which is used to keep the bronze thrust washer from rotating.

## Will the Axle Break the Crankshaft?

Q.—What causes a crankshaft to break?

Breakage of a crankshaft or any element or piece of metal is due in the final analysis to the application of a force greater in magnitude than the strength of the shaft. In the crankshaft this would amount to the tensile strength and resistance to torsion of the shaft.

2.—We contend that a sudden resistance placed upon the rear axle will be transmitted directly to the crankshaft. We are in a dispute about this matter. Will or will not a sudden binding or locking of the rear axle be transmitted to the crankshaft? If so what ratio will the shock upon the crankshaft be to the original resistance.—Citizens Auto Co., Quitman, Ga.

Practically speaking a sudden shock applied at the rear axle should not break the shaft because of the fact that the elements of the driving system behind the rear end of the crankshaft have a lower factor of safety than the crankshaft power. It is difficult to imagine the section represented by two teeth of the ring gear possessing greater strength or resistance to twist or shock than any section of the crankshaft proper. Added to this, the fact that most parts of the driving system behind the flywheel must resist the inertia of the flywheel proper and thus have greater twisting strains imposed upon them, would further strengthen the idea that it is practically impossible to break the crankshaft by application of a force at the rear wheels or rear axle behind the universal joint. Assuming that the crankshaft at the time of application of the shock possesses its original strength and is in good condition it is safe to assume that the other parts will break before the shaft will be broken due to the shock applied.

## REVERSING A MAGNETO

Q.—Give me complete instructions on changing a DU-6 Bosch two spark magneto from left hand to right hand rotation.

On page 21 of the August 30, 1923 issue of MOTOR AGE there was shown an article which explained the process of reversing a magneto such as the Bosch. We are sending you a copy of this page and suggest that you study it thoroughly. The instructions will probably apply to the two spark magneto, but you can determine this from the instruction and inspection of the magneto construction.

2.—Give instructions for installing a hot spot with dash control on a series 4 38 h. p. Pierce, 1917 model.

We will give you by letter names of concerns making hot spot manifolds. If they have manifolds suitable for this purpose they will be able to supply instructions for installing same.

3.—Give horse-power and torque curves for this engine.—E. Johnson, Lincoln High School, 19th street & Tracy avenue, Kansas City, Mo.

This data is not available in our files. You can possibly get the information direct from the factory.



# BOOSTING ACCESSORY SALES

**WOODWORKERS' Hardware Mfg. Co.**, 1201 Cortland street, Chicago, are the producers of a new type of stop light copied after the standard boulevard traffic lights with the red, yellow and



*Safe-T-Lite*

green signals, which is used on the front of the car as well as the rear. It is known as the Safe-T-Lite. The system is connected up with the controlling levers of the car in such a way that the proper signals will be given automatically. For example, when the green signal is on, the car is going ahead and the driver is making no effort to stop it; if the yellow signal is on, the driver is controlling his car to slow down, or if already standing still, is getting ready to go. If the red signal shows, the driver is actually trying to stop, or has already stopped. The signals cannot be given unless the driver is controlling his car in a way corresponding with them.

In addition to the code of signals provided by the boulevard system, there are two additional signals, operated by hand and indicating whether the driver intends to turn to the right or to the left. These signals are orange and violet. The device is in the shape of the letter "T."

## Advertising Tire Covers

Sales Equipment Co., Kerr Bldg., Detroit, Mich., supplies dealers with tire covers on which appear the name of the dealer and "Ford Products." Covers also are furnished showing the name of city or street address underneath. Long-grained enameled drill is used in the construction of these covers. The coil spring which holds the cover in place is of a special construction to insure an even tension around the entire cover and to make it fit snugly when used on either fabric or cord tires. Prices range from 93 cents to \$1.35 each, dependent upon the quality and style ordered. Covers for

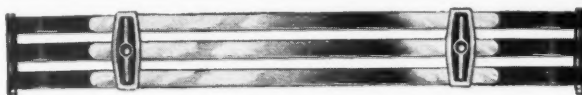


*Advertising tire cover*

balloon tires sizes 28.40 or 29.40 sell for 10 per cent above the prices named.

## Federal Adds Triple Spring Bar Bumper

The Federal-3 is the latest addition to the bumper line made by the Federal Pressed Steel Co., Milwaukee, Wis. This bumper has three 2-in. oil-tempered spring bars anchored at both ends with

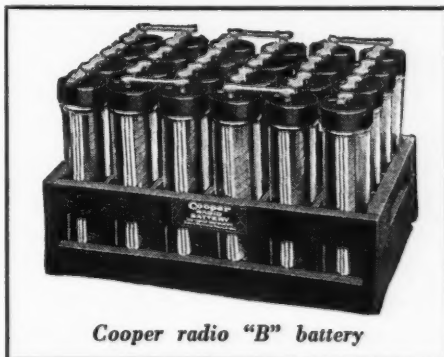


*Federal-3 bumper*

heavy cast clamps in keeping with the size of the new bumper. It is made with bars finished in nickel or black as well as in a combination style,—black bars with nickel plated alloy sheaths are guaranteed by the manufacturer not to rust.

## Cooper Radio "B" Battery

With a capacity of 5,000 milli-ampere hours, this battery is enclosed in a mahogany case. The element containers are



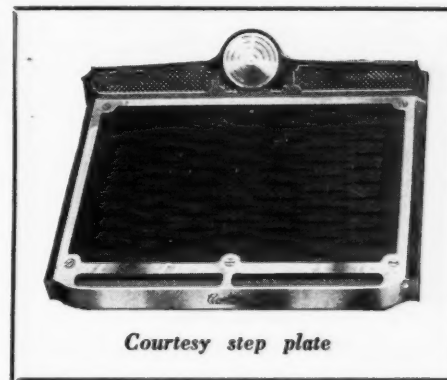
*Cooper radio "B" battery*

of heavy glass and the plates are of a special mix designed to make them more porous. The separators are treated with Port Orford cedar, and a special rubber rest has been provided to fit in the bottom

of each glass cell. The purpose of the rest is to form a cushion support for the plates to extend below them in order to prevent possibility of short circuiting across the bottom. Each glass cell is sealed with a hard rubber cover to prevent leakage of acid. The terminals are of lead and are burned on in order to insure tight connections. The battery is made in 24 and 48-volt sizes which sell for \$7.95 and \$13.95 respectively. It is made by the Cooper Corp., Cincinnati, O.

## Courtesy Step Plate

A new electrical automotive device which has been introduced is the Courtesy Step Plate, made by the Dunhameter Corp., 230 E. Ohio street, Chicago. It combines in one unit a step plate, kick plate, footscraper and courtesy or "right-of-way" light. Red lights on the left automatically warn the driver approaching from that direction that you have the right of way; green lights on the right signal the driver approaching from that direction that the right of way



*Courtesy step plate*

is his. It also serves as an illumination for the running board and side parking light.

It is unnecessary to cut into the apron of the car for the lights in the Courtesy Step Plate, as the one necessary connection can be made to either tail light or head lights. The single wire goes through and under the running board.

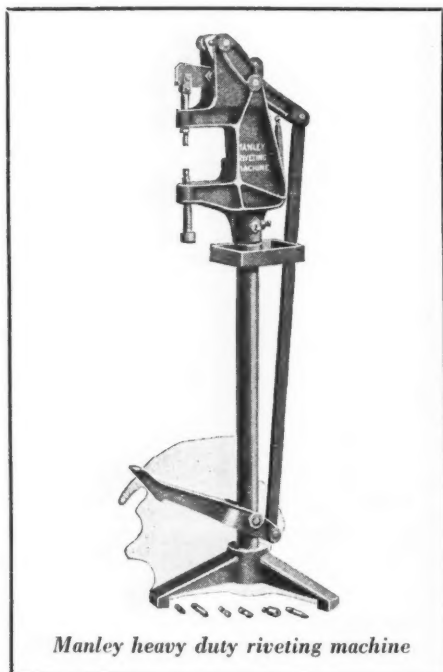
This device is furnished in sets of two. The semaphoric lens are furnished in red, green or frosted white.

## PEDRICK PISTON RINGS

On page 22 of the Nov. 27, issue of MOTOR AGE, the Pedrick oil control piston ring, made by the Wilkening Manufacturing Company of Philadelphia, was described. In this article it was stated that each ring is individually cast. This is not correct as the rings are made from pot castings.

# GETTING MORE OUT of the SHOP

THE Manley heavy duty riveting machine is the product of the Manley Mfg. Co., York, Pa., and sells for \$36. It is used for driving rivets in relining brakes. Because of its double toggle action, it is possible to exert great pressure. The adjustable lower anvil of the machine is a screw with a cap into which the dies are inserted. By adjusting the screw up or down the different thicknesses of brake bands are taken care of, and in addition the toggle can be adjusted to give maximum leverage in every case. Eight rivet sets and anvils are supplied, consisting of one cup anvil, a punch for pushing out the old rivets, two sizes of tubular rivet sets, one star rivet set, one round head rivet set, which is used as an intermediate size anvil, and one small anvil and one large anvil.



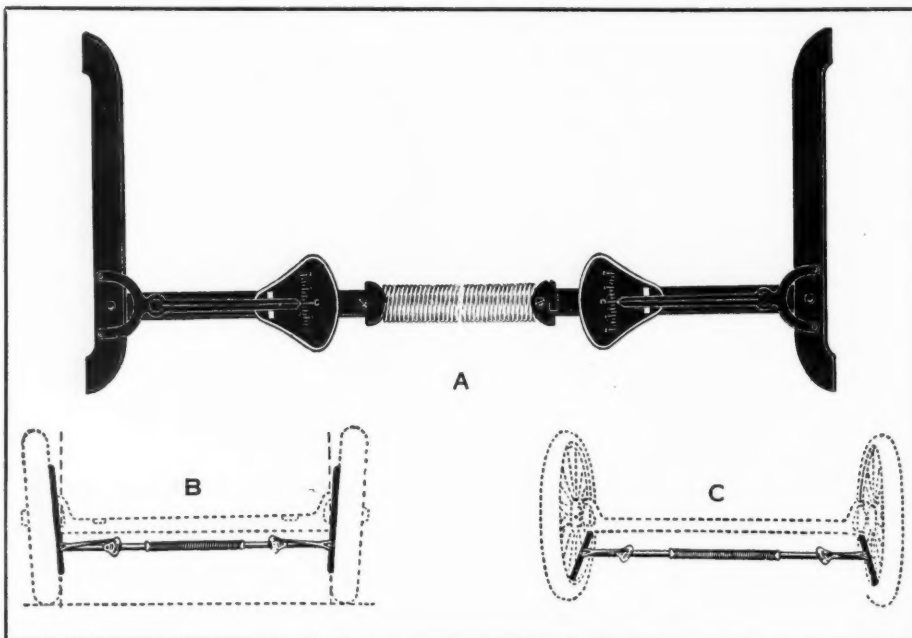
Manley heavy duty riveting machine

## An Automatic Wheel Aligner

The recent Ford Service Bulletin contains a description of an automatic wheel aligner specially designed for service station use on Ford cars. The list price to dealers is \$15 and the correct method of using the aligner is as follows:

Connect the aligner by inserting the bar through the spring and guide. First, fasten the guide bar with a flat head screw, then fasten the spring with a large round head screw. Now see that the aligner compresses back and forth freely. The arrows should point to the letter C on the dial of the instrument and the latter should then represent a perfect square.

Straighten out the wheels and see that both tires are evenly inflated. The floor or ground should be fairly level. Then compress the aligner and place it between the wheels so that the abutment bars rest firmly on the felloes and against the steel rim of the wheels. Be



The automatic wheel aligner recently brought out by the Ford company for its dealers. At B is shown the position for testing wheel pitch and at C, for toe-in

sure that they do not rest on any of the spokes or bolt heads. Where the abutment bars cannot be placed on the felloes they should be placed on a straight edge rim next to the tire without resting on the tires.

The illustration shows the aligner in two positions, one for pitch and the other for toe-in. Each line on the dial represents  $\frac{1}{4}$  in. on the wheel.

For toe-in place the aligner between the wheels as shown at C. Have the ends of the abutment bar the same distance from the floor, or as near the floor as possible. Straighten out the wheels and see that one arrow points to the center of one of the dials, then the other dial will register the toe-in for both wheels.

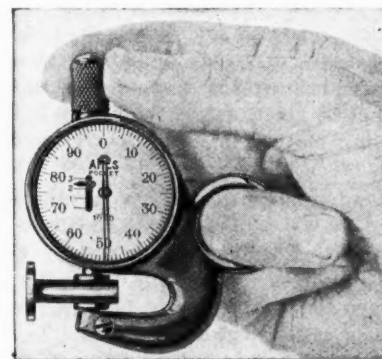
The instrument can be used for finding wobbly or sprung wheels, checking up the alignment of rear wheels, finding a sprung chassis, etc. It is also useful on wire and disc wheels as well as finding worn bushings in the steering connecting rods.

## Ames Pocket Gage

The Ames Pocket thickness gage has been added to the models of micrometer dial gages manufactured by B. C. Ames Co., Waltham, Mass. It provides for reading in thousandths of inches and fits into the vest pocket. The dial face is only  $1\frac{1}{2}$  inches in diameter and the net weight of the gage is five ounces. The frame is of bronze and it is finished in bright nickel. A ring is attached to the frame through which the finger may be inserted to hold the gage while the thumb and forefinger are used to operate the knurled screw at top of spindle, which opens and closes the jaws. The large pointer records thousandths of inches on the dial and the small pointer records the number of revolutions made

by the large pointer. The pocket gage has a capacity of  $\frac{1}{8}$  in. and will measure flat, round, hard or soft materials up to that size or thickness. Accuracy up to .0005 in. is guaranteed by the makers.

A dial is inserted at the back of the gage which gives decimal equivalents for fractions. Readings are taken from the graduated dial on front in decimal sizes,



Ames pocket gage

and by referring to table on the back of the gage, these decimal readings can be transposed into fractional sizes.

A soft leather container is supplied with the pocket gage, which sells complete for \$12.50.

## \$50 INSTEAD OF 50 CENTS

A typographical error in the Dec. 4 issue of MOTOR AGE caused the price of the ignition point grinder made by Albertson & Co. of Sioux City, Ia., to be quoted as 50 cents. Inasmuch as the complete tool included electric motor, diamond point, four adapters, extension cord and plug, the error was obvious. The correct price is \$50.



# EDITORIAL

## Where Your Banker Comes In

ORGANIZATION in Chicago last week of a national association of automobile financing companies is of vital interest to the business of every automobile dealer. Authorities agree that between 70 and 80 per cent of all new automobiles sold today are paid for by the purchaser on a time payment plan. But the dealer cannot afford to wait for his money because he has to pay the manufacturer before he unloads the cars. The result is we have a large number of financial organizations whose function is to advance the dealer his money and take over the notes given by the purchaser.

Competition in this financing business has caused some practices to be resorted to, especially in the last year, which are not considered sound by the conservative banking interests of the country. These practices have to do with the amount of cash payment required from the time-payment purchaser and the maximum time allowed for the maturity of his notes. It was freely admitted at the Chicago meeting that some companies in order to get business had financed retail automobile sales on a cash payment of 25 per cent or less of the purchase price and on 18 months or more for maturity of the notes.

The bankers said this was not good business and if it is not good business for the bankers it is not good business for the automobile dealer, distributor or manufacturer. The banker has his say because in the final analysis he puts up most of the money used by the finance companies in their operations. He takes the finance company's notes or other security for short time-loans, and he doesn't consider 18 months or even 12 as short time. He wants his money in three to six months at the most.

Nevertheless the banker feels that the automobile is so sound and useful a commodity that it can safely be sold on 12 months' time and he is perfectly willing to make short-time loans to finance companies on security represented by deferred installment notes maturing over a period of 12 months, the vehicle itself being the ultimate security.

But Mr. Banker believes that the purchaser of a new car should be able to pay in cash at least one-third of the price. The finance companies themselves agree that this is desirable and more liberal terms were accepted only because of competition. The experience of one company is interesting. In deals where the cash payment was 25 per cent repossessions averaged one out of nine sales. When the cash payment was 33 1/3 per cent repossessions averaged one out of 50 sales and when the cash payment was 50 per cent repossessions averaged one out of 300 sales.

It is conceivable that a tightening of credit facilities in the financing of retail sales may somewhat reduce the volume for some dealers, but that proportion of the volume

that it cuts off will be the unprofitable part. The same thing will carry all the way back to the manufacturer. Business is not sound when profit is sacrificed for volume. And no manufacturer will profit permanently unless his dealers are sound and successful business men.

A sound and successful business cannot be conducted on unsound principles. The automobile dealers of the country should give their conscientious support to a movement to correct unsound practices.

## Know Your Industry

THE most successful men in any business are those who know most about it. It is not enough for a business man to be thoroughly informed about his own business, but he should also know something about the business of his competitors. The automobile industry is probably the most dynamic of all industries. It never stands still. It is undergoing constant change and happily most of it is progressive. National show time usually marks an important step in the progressive development of the industry. The national shows this year will not be unusual in that respect. Several new cars will be announced at the New York and Chicago shows. It will pay every dealer to learn all he can about these new vehicles that he may sell or compete with. He can best learn this by attending one or the other of the shows on the two days set apart for the trade, but if he cannot attend them he can read about these new things in his MOTOR AGE.

## Selling on Serviceability

SPREADING of the flat rate method of charging for automobile repairs is bringing to the front a new sales argument. The familiar phrase, "It's not the first cost but the upkeep," is coming to mean something in the automotive industry. For too long automobiles have been sold on price and the purchaser who thought he was getting a bargain sometimes found he could ill afford to maintain the vehicle in operation because the repairs and adjustments that were necessary from time to time were all out of proportion to the original cost. Manufacturers now are devoting immense amounts of engineering ability to lowering the cost of maintenance with the object of making their cars more salable in competition with others.

## Speed and More Speed

TWO new world's speed records were established by the internal combustion engine within the last few weeks. In France an airplane in test flight was driven at the rate of 288 miles per hour. In California an American-built racing car with an American driver set an average speed of 126.9 miles per hour for 250 miles. On land or in the air the motor vehicle is supreme, and we wonder what great worlds it will conquer in the future.

# Expect Active First Quarter at Plants

## Automobile Makers Replenish Parts and Accessory Stocks

### Automotive Jobbers Offer Encouraging Reports, Good Gain in November's Business

NEW YORK, Dec. 15.—A start has been made by automobile producers to replenish stocks of parts and accessories which have been held down to a minimum since the decline in sales and production of cars set in. The volume of orders placed so far indicates an active manufacturing first quarter on the part of passenger car builders and an immediate pick-up among parts makers. The move toward replenishing stocks has come earlier in the month than was anticipated.

Reports from automotive jobbers are encouraging, November showing a 10 per cent increase over the corresponding month of last year. Healthy gains are shown among the jobbing houses identified with agricultural trade. December is not expected to break records in this merchandising branch of the industry but it will establish good marks. Dealers are reported to be buying cautiously, stocks are low, production is restricted to meet demand and there is a growing feeling that a shortage of stocks among dealers will exist when the real spurt in buying comes.

### Next Year's Program

Definite progress for automobile production next year will be settled upon following the opening of the show season in New York the first part of January. The New York show will give an indication of the demand producers may expect for the first quarter, at least, not only from the extent of retail buying but from the orders placed by visiting dealers in the metropolitan area.

Although manufacturers regard the first quarter of next year with optimism they will not attempt to gage demand until concrete evidence is given of its probable extent. December will see a cessation of operations among some of the producers for a few days around the holidays to permit of plant overhauling and to pave the way for larger operations in 1925 so that the output for the month is likely to fall below that reported in November. Such a drop is normal to the season and follows the usual production curve. There will be no effort this month to step up schedules.

Among the tire makers appears increased activity in preparation for large business in 1925. Some of the major producers are completing factory extensions and others are gearing up their present facilities to capacity. Replacement business is expected to form a substantial part of the sales next year.

## Identification Okeh as Trade Day Pass

NEW YORK, Dec. 15.—In sending out credentials for the trade days at the New York and Chicago national automobile shows the show management feels that naturally many persons eligible to attend the shows on these days will be overlooked. The management, therefore, announces that whether or not they receive credentials all responsible people in the trade can attend and should attend. All they have to do is to identify themselves at the Bronx Armory in New York or the Coliseum in Chicago.

Mailing of credentials was started today.

Wide interest is being shown in the trade days among all branches of the industry.

## Consolidate Bendix Engineering Works and Perrot Brake Corp.

CHICAGO, Dec. 13.—Announcement is made of the consolidation of the Perrot Brake Corporation, South Bend, Ind., controlling American rights to the Perrot patents, and the Bendix Engineering Works, Chicago, which controls the patent rights of the Bendix Drive. The new organization, to be domiciled in Chicago, will be known as the Bendix Corporation. It will have a capital of \$3,000,000.

The president of the new concern will be Vincent Bendix, originator and patentee of the Bendix Drive. J. L. Price, formerly vice-president of the Chicago Pneumatic Tool Company, will serve as vice-president and general manager.

It is stated that manufacturing facilities at the plant in South Bend will be greatly increased to take care of the growth in demand for four-wheel mechanical self-energizing brakes.

Mr. Bendix for years has been a prominent figure in the automotive industry. The Bendix Drive is used with a very large proportion of self-starters for automobiles.

### LEAVES RICKENBACKER CO.

DETROIT, Dec. 15.—A. J. Banta has resigned as sales executive of the Rickenbacker Car Co. with which company he has been for the past two years as associate to Capt. E. V. Rickenbacker, vice-president in charge of sales. Mr. Banta is one of the old timers of the industry. He has been connected with both truck and passenger car makers servicing both at the factory and at factory branches and distributing points.

## California Durant and Star Corporations to Be Merged

### Combination Establishing Organization With Six Million in Assets Soon Will Be Effective

OAKLAND, Cal., Dec. 15.—Oakland-Durant Motors, Inc., of California, and Star Motors Inc., of California, are to be merged into a corporation with assets of \$6,000,000, according to an announcement by W. C. Durant here Saturday.

Mr. Durant said that negotiations for the merger have progressed to the point at which it is assured but that complete details cannot be given out. The combination will be completed by the end of December. R. C. Durant, president of Durant Motors, Inc., will be president of the merged organizations and Norman De Vaux, president of Star Motors, Inc., will be vice-president and general manager. The new combination will be known as the Durant-Star Motors, Inc., and will cover six western states, with headquarters in Oakland, Cal., where are located the present headquarters of the merged firms. Manufacturing plants will remain as at present near Hayward, a few miles from Oakland.

Report that headquarters would be removed to Los Angeles was denied by Mr. Durant. The two concerns in the past have had interlocking boards and similar stock ownerships but each has been conducted separately. Star Motors has had a contract with Durant Motors under which the latter makes and supplies the former all Star cars for distribution and sale by it. For this Durant receives a profit on cars sold instead of a fixed manufacturer's profit.

In recent past Durant Motors, Inc., and Star Motors, Inc., have been merged, as have also the Star and Durant subsidiary companies in Michigan, Indiana, Canada and England. This California combination is the final merger of the subsidiaries of both corporations.

## Stanley Will Announce New Steam Car at Big Shows

NEWTON, Mass., Dec. 15.—The Stanley division of the Steam Vehicle Corporation of America will announce a new steam passenger car at the New York and Chicago automobile shows. This car will be somewhat smaller and lower priced than the present Stanley models. It will have 122 in. wheelbase as compared with 130 in. wheelbase of the present models. It will be more compact and four inches nearer the ground. There will be two body styles, a 5-passenger phaeton at \$2500 and a 5-passenger sedan at \$3300.



## Sound Basis For Automobile Financing Defined as New Association Is Formed

(Continued from page 13)

N. A. D. A. some time ago and which in substance are nearly identical with the policies of the Finance Association.

The position of the dealers' organization is as follows:

1—In new passenger automobile financing, a minimum down payment of not less than one-third of the retail delivery price.

2—Balance in equal periodic notes of not more than 12 months' duration.

3—In used passenger car financing a minimum down payment of not less than 40 per cent of the purchase price.

4—Balance in equal periodic notes, preferably in eight months and not longer than twelve months' duration.

Mr. Gambill, among other things said: "We believe that a recent tendency to lower the down payment to less than one-third of the total retail delivery price, and a practice that has become noticeable in some of the far western states to extend longer time than 12 months principally by use of a renewable note at the end of the twelfth month, which in turn is divided into monthly payments over six months or more, are features which are unsound and which ultimately can but lead to disaster in the trade."

Mr. Gambill further asserted that the N. A. D. A. believes a vital element of the association's program should be in measures looking to the protection of a dealer's equity in a car.

### Manufacturers to Co-Operate

Alfred H. Swayne, vice-president of General Motors Corporation, but speaking as chairman of a committee appointed by the National Automobile Chamber of Commerce, to make a study of the time payment situation, sat on the platform through most of the proceedings and gave the financing companies the benefit of his suggestions. He spoke several times and just before leaving expressed his pleasure at what had been accomplished and assured the association that it would have the sympathy and co-operation of manufacturers in any effort to put retail financing on safer business basis. Mr. Swayne declared that in his opinion the automotive industry would be benefited, as well as the finance companies, by the program decided upon. Much assistance was given the organization committee by Arthur W. Newton, vice-president of the First National Bank, Chicago. He told the delegates that if the tendency toward loose credit practices were continued banks soon would be forced to withdraw their accommodations from many automobile financing companies. There seemed to be a unanimous feeling that the finance companies

face an emergency which can be met only through drastic co-operative action. It was pointed out that the association's program necessarily contemplated the well being of the finance industry and the automobile retail trade as one problem. The idea advanced was that the finance industry can only hope for stabilization and prosperity commensurate with that of the retailer's time payment business.

Wednesday night the delegates were guests of the Central Automobile Finance Association, of Chicago, at a banquet and entertainment.

### Officers and Directors

Following is a list of the national association's first officers and directors:

President, A. E. Brooker, Securities Investment Co., St. Louis.

First vice-president, John L. Little, National Bond and Investment Co., Chicago.

Second vice-president, F. R. Williams, Finance and Guaranty Co., Baltimore.

Third vice-president, J. J. A. Fortier, Equitable Credit Co., New Orleans.

Fourth vice-president, L. F. Weaver, L. F. Weaver Co., San Francisco.

Secretary & treasurer pro tem, W. G. Tennant, Tennant Finance Corp., Chicago.

Directors at large: Henry Ittleson, Commercial Investment Trust, New York; C. E. Vesy, American Credit Co., Omaha; John L. Little; E. M. Morris (who served as chairman of the meeting), Associates Investment Co., South Bend; J. J. Shumann, Jr., General Motors Acceptance Corp., New York; G. A. Piviotti, Automobile Finance Co., Pittsburgh; A. E. Duncan, Commercial Credit Co., Baltimore; R. D. Ewing, Motor Finance Corp., Toledo; J. J. A. Fortier; C. Ray Rule, Pacific Finance Co., San Francisco; A. E. Brooker.

Reserve District Directors: First—Timothy L. Byrnes, Industrial Finance Co., Boston; Second—David B. Costello, Syracuse Investment Co., Syracuse, N. Y.; Third—G. B. Squires, National Guaranty and Credit Corp., Philadelphia; Fourth—A. A. Ross, Colonial Financial Trust, Pittsburgh; Fifth—F. R. Williams, Finance and Guaranty Co., Baltimore; Sixth—Glenn B. Ryman, American Discount Co., Atlanta; Seventh—A. E. Holton, Holton & Co., Detroit; Eighth—E. W. Carter, Carter Guaranty Co., Louisville Ky.; Ninth—L. M. Rocheford, Northern Finance Corp., Minneapolis; Tenth—R. C. Kemper, Interstate Securities Co., Kansas City; Eleventh—William Ratcliffe, Union Securities Co., San Antonio; Twelfth—L. E. Weaver, L. F. Weaver Co., San Francisco.

## Disher Named A. M. A. Head Succeeding Noah Van Cleef

### Retiring Executive Showered With Testimonials for Constructive Work in Past Two Years

CHICAGO, Dec. 13.—The Automotive Manufacturers' Association at its annual meeting and entertainment last night held at the City Club, Chicago, declared the election of the following new officers and directors:

President, G. F. Disher, Gemco Mfg. Co., Milwaukee.

First vice-president, E. E. Warfield, Gill Mfg. Co., Chicago.

Second vice-president, C. D. Pettingell, Apco Mfg. Co., Providence, R. I.

Directors (Two Years): J. A. Anderson, Stone Mfg. Co., Chicago; Smalley Daniels, New Era Spring & Special Specialty Co., Grand Rapids; O. Q. Hinds, Grigsby-Grunow-Hinds Co., Chicago; A. C. Johnson, Apex Electric Mfg. Co., Chicago; John F. Shuford, Wedler-Shuford Co., St. Louis; C. W. Stowell, Outlook Co., Cleveland. N. A. Petry, of N. A. Petry Co., Philadelphia, was elected for the one-year term to fill a vacancy.

The hold-over directors are as follows: Eugene H. Haller, Hill Pump and Valve Co., Chicago; A. C. Johnson, Apex Electric Mfg. Co., Chicago; Franklin Mayo, Lincoln Products Co., Chicago; Frank Parizek, Illinois Brass Mfg. Co. Chicago; C. C. Secrist, Victor Mfg. & Gasket Co., Chicago.

W. E. Green, who has been serving as permanent executive secretary will hereafter also serve as treasurer. Heretofore the treasurer has been elected from the membership.

The election marked the end of two years administration as president by Noah Van Cleef, of Van Cleef Brothers, Chicago, during which period the association made such constructive progress that the meeting was marked largely by a shower of testimonials indicating the membership's appreciation of the retiring executive's services. He was presented with a large silver pitcher. This was followed by presenting the retiring treasurer, James T. Greenlee, of the Imperial Brass Mfg. Co. with an ornate lamp in appreciation of his fine services.

It is planned by the association to make 1925 a forward year with respect to its activities. One feature will be a campaign for 200 members. The present membership is 120, a large part of which is of comparatively recent growth.

### ARNOLD TAKES ON LINCOLN

LOS ANGELES, Dec. 15.—Harold L. Arnold, who for 13 years was the Hudson distributor in Southern California, has taken on representation of the Lincoln. It is expected Mr. Arnold will add a lower-priced car to his representation but it is said to be unlikely this will be the Ford. Several lines are known to have been offered him.

## Thousands See Birmingham's First Great Automobile Show

**Exhibit Staged in Auditorium Where Latest Car Models and Accessories Are Displayed**

BIRMINGHAM, Ala., Dec. 15.—The Dixie Automobile Show, Birmingham's first great automobile exhibit, was held for a six-day run at the Municipal Auditorium under the auspices of the Birmingham Motor Trades Association. The arena of the auditorium was given over to motor car displays while the stage was used for displays of tires, accessories and parts.

The hall was hung with royal purple draperies and immense baskets of flowers, forming a beautiful background for the many striking colors and designs that are the season's offering from the automobile manufacturers of the country. A small admission fee was charged, and thousands paid it every afternoon and evening to see the display.

In the accessories division were a number of features that came from the Chicago A. E. A. show. Radio equipment, offered in connection with the automotive accessories business, was a feature.

Every afternoon and evening during the show there were vaudeville stunts for the amusement of the crowd.

G. P. Caldwell, secretary of the Motor Trades Association and general manager of the show, announced that the exhibits put in by the automobile manufacturers were worth in excess of a half million dollars.

The following committee from the Birmingham Motor Trades Association had charge of the show: T. M. McCarty, president and chairman; H. E. Bissell, P. R. McCormick, C. W. Drennen, Ted Brownell, A. R. Pryor, W. S. Edwards Jr., and Douglas Kirpatrick.

Those who exhibited motor cars and the makes they exhibited were as follows:

McCarthy-Greene Motor Company, Chandler; Edwards Motor Company, Chevrolet; Newman-Johnson Motor Company, Oldsmobile; Cruse-Crawford Manufacturing Company, Studebaker; Willys-Knight-Overland Company, Overland and Willys-Knight; Bissell Motor Company, Reo, radio; Birmingham Ford dealers, Ford cars; Packard Motors Company, Hupmobile, Packard; Pryor Motor Company, Hudson, Essex; Drennen Motor Car Company, Cadillac, Buick; Detroit Motor Car, Paige, Jewett; Brownell Auto Company, Dodge Brothers Cars; McCormack Brothers, Pierce-Arrow, Nash.

### OPERATING CHICAGO C. G. PLANT

CHICAGO, Dec. 8.—The Chicago factory of the C. G. Spring and Bumper Co. is now in full production and operation at the Kalamazoo plant have been discontinued entirely, according to a statement issued by the company. The company reports sales at a considerably higher level than at this time last year and sees excellent prospects for a steady demand. Increases in delivery specifications are reported to have been received recently by the Detroit factory from manufacturers.

## Mayor Will Return to Dealership

CHARLOTTE, N. C., Dec. 15.—Mayor J. C. Walker of this city, who was an automobile dealer before he became mayor nearly four years ago, is expected to resign his office about Jan. 1, to take charge of the Ford automobile agency at Columbia, S. C., now held by the Dupree Auto Company. The new concern has been chartered under the name of J. O. Walker, Inc. It is capitalized at \$50,000. J. O. Walker is president and treasurer, M. C. Walker vice-president and secretary, and the same two are the directors.

## 250 Tradesmen Attend Ohio Association's Annual Meeting

**Dr. F. E. McClure, of Akron, Elected to Serve as Organization's Head for Ensuing Year**

COLUMBUS, Ohio, Dec. 15.—The Eighth Annual Convention of the Ohio Automotive Trade Association was held at the Deshler Hotel, Dec. 10 and 11. Secretary E. J. Shover reported the association in good financial shape. A general discussion led by Chas. E. Doan of Toledo, president, on "Preparations for 1925" indicated that the association wants executive secretaries of local associations to become a part of the executive board of the state association.

Senator W. A. Alsdorf, secretary of the Ohio Good Roads Federation, talked on "The Limiting Factor in Motor Vehicle Sales — Unimproved Highways" and brought out the point that as soon as road maintenance stops, the sale of automobiles will automatically slacken. "Significance of Research in Business" was the subject of a talk by G. W. Starr, assistant director of the bureau of business research at Ohio State University.

(Continued on page 35)

### SOON OPEN BRANCH OFFICE

NEW YORK, Dec. 15.—The first branch office to be established by the credit department of the Motor and Accessory Manufacturers' Association will be opened in room 2125, First National Bank Building, Detroit, the latter part of this month. H. J. Quirk will be in charge.

Mr. Quirk, who was formerly assistant treasurer of the Standard Steel & Bearings Co., Inc., a subsidiary of the Marlin-Rockwell Corp. of New York, has had long experiences with credits both among manufacturers and jobbers.

The branch office has been named for the convenience of members in the Detroit territory and to help collect and disseminate credit information more quickly.

## Case Now in Production on New Jay-Eye-See Line of Cars

**Series Offered to Public in Five Body Styles Priced from \$1,840 to \$2,690**

RACINE, Wis., Dec. 14.—Production is now under way on the new Jay-Eye-See line of automobiles by the Case Motor Car Division of the J. I. Case T. M. Co. This line was recently announced as the "Ten-Year Car." The chassis is practically identical with that of the Case Model Y line, production of which is being continued, except that it is somewhat smaller, to accommodate five-passenger bodies instead of the seven-passenger bodies of the Model Y.

Both models have a Continental six-cylinder engine, but the Jay-Eye-See engine is 3½ by 4½, as compared with 3¾ by 5 in the Model Y. The newer model uses a 1¼-inch Schebler carburetor as compared with 1½-inch used on the larger model.

Other comparisons of the Jay-Eye-See model with the older model wherein there are differences follow:

Rear axle shafts, diameter, J. I. C., 1¾ in.; Model Y, 1⅞ in.

Frame, J. I. C., 6⅞ x 2½ x ⅝ in.; Model Y, 6½ x 2½ x ⅞ in.

Brake drums, J. I. C., 14 x 2 in.; Model Y, 16 x 2½ in.

Front springs, J. I. C., 2 x 39 in.; Model Y, 2 x 39½ in.

Rear springs, J. I. C., 2¼ x 55 in.; Model Y, 2½ x 57 in.

Wheel base, J. I. C., 122 in.; Model Y, 132 in.

Tires (cord), J. I. C., 32 x 4½ in.; Model Y, 33 x 5 in.

Lockheed hydraulic four-wheel brakes are now standard equipment on both models. Balloon tires are furnished at extra cost. Both models are equipped with Saal high-pressure chassis lubrication.

The Jay-Eye-See line is furnished in the following body styles and prices:

|                       |         |
|-----------------------|---------|
| Roadster .....        | \$1,840 |
| Touring .....         | 1,885   |
| Special touring ..... | 2,160   |
| Brougham .....        | 2,690   |
| Sedan .....           | 2,590   |

Standard equipment on the enclosed models includes windshield wiper, rear-view mirror, motometer, clock, and heater. Optional color finishes are Jerry blue, platinum blue, and Case grey.

### REPRESENTS LOCKTITE CO.

CHICAGO, Dec. 8.—H. H. Panzlau, formerly with the X Laboratories, now is representing the Locktite Patch Company in Minnesota, Wisconsin, Northern Iowa and the Dakotas, with headquarters in Minneapolis. The company has also engaged the services of Harry Ruben as eastern representative, covering the New England states and the metropolitan district of New York.



## A. E. A. Completes Plan for Cost Survey Among Jobbers

### Investigation Follows Preliminary Study by Harvard, But Will Be More Comprehensive

CHICAGO, Dec. 11.—At a meeting of the Merchandising Committee of the Automotive Equipment Ass'n here last week arrangements were completed for a second survey of the cost of doing business in the automotive jobbing field by the Bureau of Business Research of the Harvard University. A preliminary survey made by the Harvard Bureau last year was analyzed and presented before the Automotive Equipment Ass'n at its spring meeting last April in New Orleans. This survey, while pointing out many interesting facts about the automotive jobbing business, was not considered conclusive enough because of the great divergence in methods of bookkeeping and accounting by the various jobber members of the association.

The new survey is expected to cover the field in much more detail and with greater accuracy. It is also hoped that in this survey returns will be received from considerably more jobbers than in the last survey. Blanks will be sent early in January to all automotive jobbers who are members of the A. E. A. and returns are to be made on or before April 1. The Merchandising Committee expects to have the results of the survey ready for presentation to the association at its summer meeting in Colorado Springs the week of June 22nd.

### Group Meetings Planned

The program was approved for next year by the Merchandising Committee which will result in the holding of group meetings of A. E. A. members in all states in which there are two or more members. Arthur R. Mogge, Director of the Merchandising Department, will be in charge of these meetings. The program, although planned to cover the year 1925, will be put into operation immediately and the first meeting will be held at Denver on December 17. Mr. Mogge will then hold meetings in other western states as follows: Salt Lake, Utah, Dec. 19; Los Angeles, Cal., Dec. 22; San Francisco, Cal., Jan. 6; Portland, Ore., Jan. 12; Seattle, Wash., Jan. 12; Spokane, Wash., Jan. 15; Billings, Mont., Jan. 17; Fargo, N. D., Jan. 19; St. Paul, Minn., Jan. 20.

To additional members were appointed to the Merchandising Committee making a total of seven as follows: L. A. Safford, Chairman; N. F. Ozburn, Vice-Chairman; Arthur C. Storz, W. E. Wissler, R. W. Proctor, W. T. Morris, and H. E. Erwin.

### GETS N. K. A. APPOINTMENT

NEW YORK, Dec. 13.—The Wollmra Engineering Corp., 224 East 42nd Street, New York, has been appointed American representative for the N. K. A. Ball and Disc Bearings, of Gothenburg, Sweden.

## 250 TRADESMEN ATTEND OHIO'S ANNUAL MEETING

(Continued from page 34)

He said that judging by four business barometers—interest rates, farm receipts and productions, number of blast furnaces in operation and exports, business conditions during 1925 will improve. Lynn M. Shaw, assistant general manager of the National Automobile Dealers' Association spoke on "The Gold Mine in the Grease," following the talk on "Stabilizing the Industry," by C. A. Vane, general manager of the National Automobile Dealers' Association. Mr. Shaw stated that during his travels about the country dealers generally reported that the maintenance department is the one that is showing a net profit at this time.

At the annual banquet in the evening of the first day Wm. B. Burrus, Cleveland, sales consultant, spoke on "Wishers and Wanters."

Officers elected are as follows: President, Dr. F. E. McClure, Akron; first vice-president, Brisley, Columbus; second vice-president, F. K. Boggs, Dayton; treasurer, O. L. De Weese, Lima; secretary and general manager, E. J. Shover, Columbus. Gordon Smith, Middletown; William Moler, Athens; G. F. McGraw, Bellaire; J. C. Kaiser, Kenton; H. W. Brinkmeyer, St. Marys; Charles E. Bishop, Cincinnati and Walter S. Barrett of Chillicothe were re-elected to the board of directors with two new ones coming in, namely, A. M. Stamm, Williamsburg and Irven Knupp, Sidney.

After some discussion on the gasoline tax for motor vehicles it was pointed out that while the association is not opposed to a tax of this kind, neither is it for such a tax, but is in favor of a uniform tax whereby the improved roads will be maintained and a resolution to this effect was adopted.

## STAGE NOVEL CONTEST

NEW ORLEANS, Dec. 15.—A novel plan to stimulate sales is being used by W. H. Hendren, Jr., general manager of the Motor Sales and Service Company, of New Orleans. It is a "Trip-to-the-Factory" contest for the retail sales force for Chrysler and Maxwell cars.

The thing that whets the enthusiasm of the salesmen to a sharp edge is a large chart of the route from New Orleans to the factory on Lake Erie, and upon which miniature motor cars, one for each salesman, are placed and advanced from day to day to indicate the progress that the salesmen make. An advance of one mile is made for each \$20.80 in volume of sales.

The contest will close Dec. 31 unless some salesman reaches Detroit before that time. The winner will receive a trip to the Chrysler-Maxwell factory.

## Gardner Motor Car Company Announces 8-In-Line Series

### New Touring Car and Brougham Models Will Sell Each for \$1995 f. o. b. St. Louis

ST. LOUIS, Dec. 15.—Gardner Motor Car Co. announces an eight-in-line series consisting of a special touring car and a brougham, each to sell for \$1995, f.o.b. St. Louis. The new models will be displayed at the New York automobile show.

Both are five passenger cars with long low-swung bodies mounted on a 125-inch wheelbase chassis with a 7-inch frame housing and 6 cross members, two of which are of the tubular type. Both are equipped with 30x5.77 balloon tires, enclosed 14-inch 4-wheel brakes, five 20-inch disc wheels and special balloon type shock absorbers. They are finished in Duco in attractive two-tone color combinations.

On both the open and closed models instruments, including a heat indicator and gas gage, are grouped on an instrument board under a single glass panel and are indirectly lighted. The Borg and Back clutch, Fedders radiator, Schebler carburetor and Gemmer steering gear are standard equipment on both models. The chassis is lubricated by the Alemite system, except the fan and universal joints, which are of an advanced oil type.

The Gardner brougham has windows of clear-vision plate glass, the interior is upholstered in velvet velour, the windshield is the one piece vertical ventilating type with automatic wiper. Doors are 31 inches wide and have walnut panels and double locks. Some of the other features are satin finish hardware, rotary type lifts on all four windows, dome light, rear-vision mirror, flush type cowl ventilator, combination stop and tail light, nicked radiator and transmission lock.

### The Special Touring

The special touring car is equipped with a permanent top, flush type cowl ventilator, cowl lamps, flat light reflector in headlights, automatic windshield wiper, transmission lock, spot light, combination stop and tail light, extra tire, tube and cover, and double bar bumpers front and rear. The upholstery is in genuine Spanish leather and the new type windshield is water-tight and draft-proof.

The new series is powered with an L-head type motor of 3½ inch bore and a 4½ inch stroke giving a piston displacement of 276 cubic inches and 75 horse-power on the brake. Cylinders are cast en bloc, and cylinder heads are detachable, providing easy access to valves and pistons.

Positive full-force feed lubricating system is used, and the entire lubricating system is contained in the upper half of the crankcase. Oil pressure is automatically controlled by the opening and closing of throttle instead of by the speed of the motor in order to insure maximum pressure when the motor is under load.

## Hoover Asks Clarification of Laws on Trade Associations

### Secretary Regards Business Organizations as Important Agencies in Campaign Against Waste

WASHINGTON, Dec. 15.—An appeal for a more liberal interpretation of the laws governing trade associations, which he characterizes as the biggest factor in the elimination of industrial waste, features the annual report of Secretary of Commerce Hoover, which has just been made public. His report deals chiefly with the necessity of eliminating the wastes in industry. He refers to trade associations as follows:

"One of the most important agencies through which the elimination of waste may be promoted is the trade association. It is true that a small minority of these associations have been in the past used as cloaks for restraint of trade by such activities as open-price associations and other attempts to control distribution or prices. It is equally true that the vast majority of trade associations have no such purpose and do no such things. The dividing line, however, between what activities are in the public interest and what are not in the public interest is not today clearly defined either by the law or by court decision, as it should be.

#### Need for Definition

"In consequence of recent decisions of the courts, many associations are fearful of proceeding with work of vital public importance, and we are losing the value of much admirable activity. At the same time we are keeping alive the possibility of wrongful acts. It is imperative that some definition should be made by which an assurance of legality in proper con-

duct can be had, and by which illegality or improper conduct may be more vigorously attacked.

"Any collective activity can be used as a smoke screen to cover conspiracy against the public interest, but that is no reason for condemning all collective activities. Just because automobiles are sometimes used by bootleggers for the illegal transportation of liquor we do not prohibit their manufacture or their legitimate use."

#### R. M. OWEN SUCCEEDS HOUPPT

NEW YORK, Dec. 15.—Harry S. Houpt has retired as president of the Hudson Motor Car Co. of New York and has been succeeded by R. M. Owen, treasurer of the company. Mr. Owen, in whose name the Hudson franchise has been held for the last eight years will continue as treasurer.

R. B. Cole, sales manager, has been promoted to the post of general manager, and Herbert L. Boehm, city sales manager, becomes retail sales manager.

#### NEW FIRM STYLE

BAY CITY, Mich., Dec. 15.—The Gibb Instrument Company, of Bay City, has changed its name to the Gibb Welding Machines Company. It is announced that this is a change in name only and denotes no charge in organization. As the company no longer makes instruments but is engaged exclusively in manufacture of electric welding and heating machines the new name was adopted as being more accurately descriptive of the production.

#### OPEN NEW SALES HOME

MEMPHIS, Tenn., Dec. 15.—The F. M. White Motor Co. has opened its new home at Union avenue and Dunlap street. The company handles Cleveland and Chandler cars.

## Designate Jan. 6 as Export Trade Day at New York Show

### Completing Plans for Conference of Equipment and Accessory Makers on Overseas Trade

NEW YORK, Dec. 13.—Tuesday, Jan. 6, has been designated as Export Trade Day at the New York automobile show and plans are being completed for a conference on that date of equipment and accessory manufacturers on the overseas trade. This meeting, sponsored by the Motor & Accessory Manufacturers Association, the Overseas Club of the Automotive Boosters International, and The American Automobile (Overseas Edition) and El Automovil Americano, will be held at the Big Armory, location of the Silver Anniversary Show and will be attended, according to the plans just announced, by the company executives, export managers and automotive dealers and jobbers from abroad.

Few opportunities have been given in the past for a concrete discussion of the export trade problems of the accessory and equipment manufacturing companies. For that reason, the co-operating organizations have joined together to hold a specialized conference on the exportation of such products as these. Organization details of the meeting and the observance of Export Trade Day, have been placed in the hands of a committee composed of Herman Deuster and Neal G. Adair, representing the M. & A. M. A.; H. L. Kraus and F. J. Werner, representing the Overseas Club, and J. L. Gilbert and George E. Quisenberry, representing the two international automotive publications.

# With the Associations

#### Form Credit Association

NEW YORK, Dec. 15.—The Automotive Equipment Trade Credit Association has been organized here for the mutual protection of the jobbing trade in New York City. The association will maintain an interchange bureau for credit information.

Any person, firm or corporation of good standing and reputation, acknowledged as a manufacturer or wholesaler of automotive equipment, selling in the New York Metropolitan district or interested in the same customers as members of this association, is eligible membership.

The officers follow: President, Carl Kaufman, Auto Hardware & Equipment Co., Inc.; vice-president, Albert Antkes, James Martin Corp.; treasurer, Morris Miller, Miller Auto Supply Co. Directors: Russel Pruden, W. E. Pruden Hardware Co. and M. J. Murray, Weaver Ebling Auto Co. The executive secretary is Franz Neilson, 150 Broadway.

#### Boston Show March 7-14

BOSTON, Dec. 15.—Directors of the Boston Automobile Dealers' Association have selected the week beginning with Saturday, March 7, and the days following, including the 14th, as the time for the annual automobile show, with Chester I. Campbell managing it. A contract has been let to the Atlantic Decorating Company that always provides the scenery to evolve something new and novel in keeping with Boston's traditions.

#### Says Success Is Assured

NEWARK, N. J., Dec. 15.—Manager Claude E. Holgate, of the Newark automobile show, to be held next month, states that there has been a prompt return of application blanks mailed recently to prospective exhibitors. The interest of dealers combined with the effect of the policy of holding the show

immediately after the national exhibit in New York assures the success of the Newark event, he says. Holding the Newark show immediately after the New York show obtains many New York exhibits intact for Newark that otherwise would be dismantled at the close of the New York show and sent back to factories.

#### Militiamen Direct Exhibit

NEW BEDFORD, Dec. 13.—The annual automobile show at New Bedford this year will be held Jan. 28-29-30-31 in the big armory. The affair will be directed by a committee made up of National Guard officers, some of whom are in the motor industry. The cost of space will not be large and every exhibitor will get a section big enough to display a full line. The proceeds will go to the militia companies to pay their expenses to the Inaugural parade at Washington.



## Extent of 1925 Car Sales Will Be Treated by Speaker

**James H. Collins, Economist, Billed  
for Interesting Address at  
N. A. D. A. Convention**

CHICAGO, Dec. 17.—How many automobiles will be sold in 1925?

This question which is uppermost in the minds of the automobile trade will be given a thorough discussion by James H. Collins, of New York, Economist for the United Publishers Corp., at the annual convention of the National Automobile Dealers' Association here Jan. 26-29, inclusive, at the La Salle Hotel.

Mr. Collins has for years been regarded as one of the soundest forecasters in the automobile industry. In January of last year, when manufacturing interests were quoted generally predicting a 5,000,000 production year for 1924, Mr. Collins had the courage to venture that motor vehicle production in 1924 would be approximately 3,250,000 vehicles. Actual production figures to date indicate that 1924 production will be around 3,500,000.

### Sales Method Study

The main features of the 1925 convention, according to C. A. Vane, general manager of the association, will be an intense study of salesmanship methods as applied to the industry. "Developing the Retail Sales Plan" will be presented by Edward Payton of Cleveland, president of the Cleveland Used Car Bureau. Mr. Payton has this year personally directed the sales of 11,500 used automobiles in Cleveland. Harry Collins Spillman of New York, merchandising director for the Remington Typewriter Co., will discuss "Applying the Sale Plan to the Prospect," and W. R. Burruss, sales consultant of the N. A. D. A., will discuss "Good and Bad Selling Methods in the Automobile Industry." Other topics will be financing, management, service, and used cars.

## Plans for Reorganization of Lexington Co. Under Way

INDIANAPOLIS, Dec. 13.—Definite plans for the reorganization of the Lexington Motor Co. of Connersville are under way, it is stated in a company announcement issued today. Manufacturing of the Minute Man and the Concord Lexington models is to be continued, it is understood, but the details of the reorganization plans, or how it is proposed to lift the company out of receivership, could not be learned today.

Although the policy of making no yearly models is to be continued, at the New York show the company will exhibit a new de luxe Lexington sedan. Reports from Connersville state that under Receiver Herod's management sales for 1924 have increased 30 per cent over last year's figures and schedules for double the production during 1925 have been planned.

## MERCHANDISING MAINTENANCE AT A PROFIT

(Continued from page 11)

Deducting 70 cents for labor, we have a remainder of 70 cents, which covers direct and indirect expense. Further assume that through efficiency the shop is making at the rate of \$1.70 by doing the work in less than the specified time as covered by the standard specifications. Now if it would be possible by advertising or personal solicitation to increase the productive hours, it would certainly be profitable to spend any required per cent over the actual labor cost to obtain the business. An increase of say 800 hours would cost only 800 times 70 cents, or \$560, as it would not cost anything for direct or indirect expense, as this would have to be borne anyway.

Eight hundred hours sold at the average of \$1.70 per hour would bring \$1,360, less \$560 for labor, leaves a net of \$800. An expenditure of any portion of this \$800 would certainly be justifiable to secure this additional business.

Intensive efforts must be made to anticipate these dull periods and the education of service managers and service salesmen along salesmanship lines is, we believe, the solution. Certain of our branches and distributors are doing good work in this connection, and it is now in order to lay down a course of training so that all can be definitely benefited.

During the fiscal year which ended Aug. 31, 1924, the distributing branches of the company showed a substantial profit, amounting to \$1,401,109.89. There has long been a theory in automobile circles that branch houses do not pay. We have not found this so. Another theory equally prominent is that a service department does well to break even. We do not agree to this theory either, for of the sum mentioned above our respective branch service departments contributed 39 per cent or over one-half million dollars.

### DAVIS OPENS BRANCHES

RICHMOND, Ind., Dec. 15.—The George W. Davis Motor Car Co., of Richmond, has opened two new branches in addition to the Chicago branch, the Davis Motor Car Sales Co., 2534 S. Michigan avenue. These new branches are located in Indianapolis and Cleveland, each being known also as the Davis Motor Car Sales Co. The Cleveland sales and service location is 4312 Euclid avenue. C. S. Miller, former assistant branch manager at Chicago, has been named manager and treasurer of the Indianapolis branch and C. C. Davis has been named branch manager and secretary of the Cleveland branch.

### A. F. DUNNEBACLE HONORED

LANSING, Mich., Dec. 13.—A. F. Dunnebacle, safety director of the Olds Motor Works, has been appointed secretary of the automotive section of the National Safety Council.

## Hill As Culver City Winner Sets New World Speed Mark

**Miller Special Driver Tears Around  
New Course at Rate of  
129.9 M. P. H.**

CULVER CITY, Cal., Dec. 15.—Bennett Hill, driving a Miller Special, was accredited with a new world's record yesterday when he won the inaugural 250-mile race on the new Culver City course at an average speed of 126.9 miles per hour. He negotiated the full distance in 1:58:18 3/5.

In performing this feat Hill beat the miles-per-hour average by Tommy Milton at Charlotte last October by more than seven miles, Milton's time on the new Charlotte course being 118.17 m. p. h. The first six to finish in the Culver City race exceeded the time made at Charlotte, the day's event establishing the Culver City track as a fast speedway.

Harry Hartz, in a Durant special, finished second, Tommy Milton, driving a Miller Special, finished third, while Fred Comer in a Durant Special and William E. Shattuck in a Miller Special finished fourth and fifth respectively.

Earl Cooper, the only driver with a chance to win the title of American champion as a result of a victory here, started out to bag that honor but engine trouble spoiled his chance at the end of the seventeenth lap. The championship, therefore, will be in the nature of a posthumous award for the late Jimmy Murphy.

## Sedan to Sell at \$1595 Is Announced By Auburn Co.

AUBURN, Ind., Dec. 15.—The Auburn Automobile Co. has announced a new low-priced sedan which is now being delivered to dealers and retail purchasers. This new sedan is mounted on the six-cylinder, 114-inch-wheelbase chassis. The equipment includes four-wheel brakes, balloon tires, disc wheels, snubbers, front bumper, spare tire with cover, motometer and bar cap cowl lights, cowl ventilator, gasoline gage on the dash, automatic windshield wiper, rear-vision mirror, heater, dome light, kick plates and combination stop and tail light. The sedan sells at \$1,595 f. o. b. factory.

### BUYS COLUMBIA INVENTORY

DETROIT, Dec. 13.—William Kuehne-man, Jr., has bought the inventory of the former Columbia Motors Co. at auction sale and will make up cars in working this off. These cars will be handled through regular dealer channels.

### INCORPORATE GARAGE

REIDSVILLE, N. C., Dec. 15.—Haskins-Knight, Inc., will open a garage here. Authorized capital stock of the concern is \$25,000. Incorporators are E. L. Knight, A. L. Haskins, and J. R. Clark.

## Special Census to Enumerate Motor Devices on U. S. Farms

### Government Starts Comprehensive Survey of Country's Agricultural Devices and Condition

WASHINGTON, Dec. 15.—A census of farms which will show among other things the number of automobiles, trucks, tractors, motorcycles, and gasoline and steam engines on each farm in the United States has been begun by the Department of Agriculture, which will employ 20,000 enumerators to take the census of more than six million farms. It is expected the work will be completed by January 31, 1925 and that it will require another 60 or 90 days to tabulate the results. The latest census figures, those of 1920, showed a total of 6,448,343 farms.

The inquiries which the farms are asked to answer number 178 and include in addition to automotive equipment and gasoline engines, facts on forest and forest products, farm tenure, acreage, values, debts, expenses, co-operation in marketing farm facilities, radio outfits, population, crops and kind, live stock and live stock products. The law provides that the information furnished will be strictly confidential under all circumstances, and will not be used as a basis for taxation.

### HAYES WHEEL PROFITS LIGHTER

JACKSON, Mich., Dec. 15.—Hayes Wheel Co. for the nine months ended Sept. 30 reports net profits of \$539,345 after interest, depreciation and Federal taxes, equivalent after allowing for preferred dividends to \$2.64 a share on the outstanding 197,044 shares of no par common stock. This compares with \$1,008,763 or \$5.12 a share in the corresponding period of last year. For the third quarter of this year net profit totaled \$123,115 or 44 cents a share on common after preferred dividends. In its balance sheet as of Sept. 30, the company reports accounts and notes receivable, less reserve, of \$1,317,675 and accounts payable of \$411,624.

### TAKE ON FLINT LINE

FLINT, Mich., Dec. 16.—T. S. Johnston, general sales manager of the Flint Motor Co., announces the following new dealers:

Quist & Brewer, Kingsburg, Cal.; Bennette Motor Co., Tacoma, Wash.; Woodruff Motor Co., Argentine, Kan.; Petrie Smith Garage, Plainville, Kan.; Millis Motor Co., Fredonia, Kan.; Messick's Garage, Martinsburg, W. Va.; White Way Garage, Winchester, Va.; Wilkinsburg Flint Co., Wilkinsburg, Pa.; Baker & McDowell Auto Co., Vicksburg, Miss.; Baker & McDowell Auto Co., Natchez, Miss.; Henry Tenhunen, Virginia, Minn.; Chas. Dietrich Motor Co., Louisville, Neb.; Tamms Auto Co., Avoca, Ia.; Elmer H. Hillegass, Emaus, Pa.; Mr. Clayton P. Held, Fogelsville, Pa.; Higgins Garage, Standish, Me.; Mr. Peter Medor, Lincoln, Mich.; Flint Sales & Service, Elkhart, Ind.; Gray Motor Sales, Galesburg,

Ill.; B. Z. D. Motor Sales Co., Maywood, Ill.; Iron Mountain Flint Co., Iron Mountain, Mich.; Webster & Murdough, Oneida, N. Y.; Eau Claire Chippawa Flint Co., Chippewa Falls, Wis.; Tatum Motor Co., Fayetteville, N. C.; Slayton Brothers, Tip-ton, Okla.; L. P. Burton, Weleetka, Okla.; J. H. Gwin, Oklahoma City, Okla.; Burnett & Son, Duke, Okla.; Queen City Flint Co., Plainfield, N. J.; Deckerville Motor Sales, Deckerville, Mich.; Thayer Motor Sales Co., Lafayette, Ind.; Seyler Jewell Co., 504 Washington Ave., Ann Arbor, Mich.; Greer Motor Co., Iola, Kan.; Toll Motor Co., Sharon Springs, Kan.; Garden City Flint Co., Garden City, Kan. SUB DEALERS: Benjamin Kiss, Minersville, Pa.; C. L. Laudenslager, Valley View, Pa.; John Ebling, Schuylkill Haven, Pa.; Glen N. Raycroft, St. Louis, Mich.; Hall Auto Co., Snohomish, Wash.; Snell Auto Co., Monroe, Wash.

### NEW CAR SALES SLOWER

LOUISVILLE, Ky., Dec. 15.—New car sales in Louisville during November continued to show the seasonal decline anticipated in October, although sales were about equal to November of last year. Used cars are moving fairly well. The market is in good condition, with only about ten per cent of the trade reporting a surplus on hand. Generally speaking, used car business is on a better footing than it was at this time last year. Compared to last month, about the same.

### BUICK AGENCY TO BUILD

ASHEVILLE, N. C., Dec. 1.—Webb Motor Company, Buick agency, plans the early erection of a new building on Cox avenue to house its business. Bruce Webb is president of the company.

## Mott a Possibility For Cabinet

WASHINGTON, Dec. 17.—Charles S. Mott, vice-president of the General Motors Corporation, is mentioned as a possible member of President Coolidge's cabinet after March 4. Mr. Mott's name has been put forward by his friends without any solicitation on his part. Since Secretary's Denby's retirement, Michigan has had no representation in the cabinet and it is felt that the State's industrial prestige should be recognized with a cabinet appointment.

Mr. Mott is a Republican in politics, served three terms as mayor of Flint, Mich., and entered the gubernatorial race in 1920. In that campaign he made a remarkable showing despite the fact that his name was entered only four weeks before the primaries were held. He is a veteran of the Spanish-American war, served as a major in the quartermaster's corps during the World war, and at present holds the rank of colonel in the Ordnance Department.

## Says Truck Holds Own This Year With Other Industries

### Otto Stoll Sees Greater Stability in Commercial Vehicles Than in Passenger Cars

DETROIT, Dec. 13.—Truck production and sale for the year will compare favorably with practically every other industry in the United States, declares Otto Stoll, vice-president and general manager of General Motors Truck Co. In the automotive field the year will reflect a greater stability in the truck business than in passenger cars as compared to 1923, Mr. Stoll said, trucks showing a decrease not greater than 4 per cent, while passenger car decrease will approximate 9 per cent.

The truck industry has become so necessary to the commercial industrial life of the nation that it is not subject to a radical degree of fluctuation, said Mr. Stoll. It feels the effects of general business retardation, but there is a constant demand that must be supplied if commerce is to continue to function. In the fact of generally improved conditions, both in agriculture and industry, 1925 should bring the truck business more prominently to the fore, Mr. Stoll said.

### RICKENBACKER DEALERS DINE

BOSTON, Dec. 13.—Rickenbacker dealers and their salesmen from all over Eastern Massachusetts attended a dinner and meeting given by the Clarke & Stevens Company, New England distributors, here. James C. Clarke gave the gathering details of the plans mapped out by factory officials as told to him during a visit of a week to Detroit. W. H. Stevens gave some facts and figures to show that the tide had turned and business was on the up grade, with Rickenbacker cars selling better than ever throughout the country.

### NEW G. M. A. C. BRANCHES

DETROIT, Dec. 15.—New branches of the General Motors Acceptance Corp. are to be opened or are now operating at the following cities: Charlotte, N. C., to handle business of all dealers in North and South Carolina; Memphis, Tenn., to handle business of all dealers in Tennessee, Arkansas, Louisiana and Mississippi; Omaha, Neb., to handle business of all dealers located in Nebraska and Iowa. These additional branches bring the total offices in the United States to twenty-three. There are also two offices in Canada and one in London, England.

### TO ASSIST VICE-PRESIDENT

INDIANAPOLIS, Dec. 16.—The Prest-O-Lite Co., Inc., Indianapolis, has announced appointment of Joseph H. McDuffee as assistant to the vice-president. Mr. McDuffee is devoting his time to the sale of batteries to car manufacturers for original equipment.



## Company Adopts New Savings and Stock Plan for Employees

### Du Pont de Nemours Announces System to Develop Thrift Which Replaces Old Arrangement

WILMINGTON, Del., Dec. 13.—E. I. du Pont de Nemours & Co. has announced the inauguration of a savings plan and a new stock investment plan for its employees, the two plans being substituted for others which have been in effect since 1909.

Under the new savings plan, employees, whose earnings do not exceed \$3,000 a year, may subscribe for "du Pont Thrift Certificates" up to the value of 20 per cent of their annual salary, but not exceeding \$500 at any one time. The certificates will bear 6 per cent interest which will become part of the principal semi-annually until the value of the certificates reaches \$500.

The stock investment plan provides that employees, who are not directors, may subscribe for the company's 8 per cent cumulative debenture stock at \$92 a share. The subscriptions are limited to 20 per cent of the employee's annual salary, but in no case to more than 10 shares and the company reserves the right to accept subscriptions for the coming year to not more than 6000 shares.

Under this plan, subscribers will receive the regular dividends, plus \$3 a share for five years, after full payment has been made. In case of partial payment, interest at the rate of 8 per cent will be allowed until the full amount has been paid in. Provision is made under this plan for converting holdings under the 1921-24 plan, whereby such holdings will be given the full benefit of the extra \$3 a share payment.

Many employees have taken advantage of the stock subscription plans heretofore in force. Last year 1973 of them subscribed to 6980 shares of the debenture. Of the company's 12,037 stockholders, 3028 or about 23 per cent are employees. At the time the last annual report was issued 23 out of every 100 employees were stockholders in the company.

### NEW NASH DEALERS

KENOSHA, Wis., Dec. 15.—The following dealers have been appointed by Nash Motors Co.:

Mr. I. C. Smith, Deland, Fla.; Tamiami Nash Company, Bradentown, Fla.; Joe Fanyo, Sales & Service, Watseka, Ill.; Mrs. Louise Depaepe, Pana, Ill.; Shultz Motor Company, Monterey, Ind.; S. G. Moyer & Son, Nappanee, Ind.; B. F. Smith (Nash Smith Sales) Lake Mills, Ia.; Loring G. Jones, Marstons Mills, Kan.; Tyler Auto & Mch. Co., Tyler, Minn.; Nash Newark, Inc., Irvington, N. J.; Tulip Garage & Supply Co., Inc., Tulip Ave. & Joricho Tpk, Floral Park, L. I.; Tarof-Murray Motor Co., Inc., 184 Main Street, Port Washington, L. I.; Southold Garage, Southold, L. I.; Kruse Motor Co., Inc., 86th Street and 18th Avenue, Bensonhurst, Brooklyn; Thomas Garage, St. Clairsville, O.; Floyd W. Helm, Sewickley, Pa.; Knox Nash Company, Knox, Pa.; Backman's Garage, Hellertown,

Pa.; Eck Darnell Garage, Buckhannon, W. Va.; R. A. Darnall, Gilmer, W. Va.; Burley's Garage, Davis, W. Va.; L. J. Host, Lake, Geneva, Wis.; H. A. Cook, Nanton, Can.; A. L. Clemens, High River, Can.; Medicine Hat Garage, Medicine Hat, Can.; Perry W. Pratt, Lacombe, Can.; Cardston Motors Ltd., Cardston, Can.; L. D. King, Raymond, Can.

## Philadelphia to Use 250 Gas-Electric Drive Buses

CHICAGO, Dec. 13.—The Yellow Coach Mfg. Co. has received an order for 250 gasoline-electric coaches to be used by the Philadelphia Rapid Transit Co., these coaches to be powered with the standard Yellow Sleeve Engine used at present in their Model Y coach. Instead of transmission and clutch, however, these coaches will use a generator made by the General Electric Co., this unit being direct driven by the engine. Drive to the rear wheels is by means of two motors, each having its own propeller shaft and each driving one wheel.

The driving control is very simple, there being but one manually operated lever which makes the proper connections for going forward or backward. Power and speed control are obtained by varying the engine speed with the foot throttle. No clutch is needed as the generator characteristics are such that at idling speed no power is generated.

Deliveries on these coaches by the Yellow Coach Manufacturing Co., of Chicago, are scheduled to be at the rate of 60 per month beginning in March.

### CAPITAL TIMER CO. CHARTERS

ANNAPOLIS, Md., Dec. 16.—The Capital Timer Co., Annapolis, Md., has been incorporated with \$100,000 capital stock by Clarence Beardmore, Leo H. Homand and Roy V. Tydings to deal in timers for automobiles, engines etc.,

## Want Fund for Motor Research

WASHINGTON, Dec. 6.—In order to aid the automobile industry in scientific investigation of automobile engines, their designs, performance and operation, a sum of \$25,000 is asked by the Department of Commerce in the annual budget for 1925 submitted this week to Congress.

This sum is required by the Bureau of Standards which has for several years past been active in making investigation of the basic principles underlying the design of engines and testing of automotive power, their fuel, lubricants, etc. A part of this sum is also to be expended in continuing the work of brake tests and how to promote economy in the use of fuels and safety in vehicular traffic.

## Michigan Association Meets During Detroit's Motor Show

### Questionnaire Sent Members to Ascertain Views on Proposed Revisions of Vehicle Taxes

DETROIT, Dec. 13.—The fifth annual meeting of the Michigan Automotive Trade Association will be held at the Hotel Statler, Jan. 21, the day being set aside as Michigan Day at the Detroit automobile show which will be in progress during the week. In the afternoon there will be the usual educational session with the dinner in the evening.

The Michigan Trade Association is sending out a questionnaire to its members to ascertain their views as to revisions in the schedules of motor vehicle taxation set to come up before the state legislature early in January. The questionnaire shows different methods of tax which may be used in providing for the state's highway requirements.

The association's largest regional meeting since its organization was held recently at Kalamazoo when 272 dealers from southwestern Michigan turned out to hear A. B. C. Hardy, president of Olds Motor Works, and act upon plans for the coming year's association activities.

Mr. Hardy predicted that the day of the open car is over and that from now on it would play an unimportant part in the production plans of the large companies.

He predicted that in the future production schedules would be based on surveys of the market arrived at from reports of dealers on cars on hand and cars sold, reports to be made on a ten day basis.

Charles J. DeLand, secretary of state, discussed automobile regulation and the Michigan road program.

The meeting was held under the auspices of the Kalamazoo Automobile Dealers' Association, Harry B. Parker, president. The next regional meeting will be held in Grand Rapids, under the auspices of the local association there.

### RENEW FIGHT FOR TAX REPEAL

WASHINGTON, Dec. 17.—The fight for repeal of excise taxes on automobiles, trucks and accessories was taken up again when the first gun was fired asking for the repeal of all excise taxes on automotive equipment. This is called for under a bill introduced by Grant M. Hudson, congressman from Michigan (East Lansing), and provides for the repeal of sub-sections one, two and three of Section 600 of the Revenue Act of 1924, which are the three sections covering automotive equipment. The measure was referred to the House Ways and Means Committee for consideration. There is little possibility that the bill will receive any consideration at the hands of the present Congress.

## Seasonal Campaign Contributes to Large Increase in Maintenance Business

CLEVELAND, Dec. 15.—The Stuyvesant Motor Co., at Cleveland, distributors of Chandler and Cleveland cars, have this year made a record increase in the business of the service department. The plan that produced the new business has been passed on to the other Chandler and Cleveland dealers in the territory assigned to the Stuyvesant Motor Co.

An appeal to all Cleveland and Chandler owners at a psychological period is given credit for speeding up business in the service department. The appeal was made when the car owners were all thinking about what they should do to put their vehicles in order for winter driving. It was in the form of a letter, backed up by advertising in the daily newspapers.

Every detail of service that would not only put the car in excellent shape for winter driving, but would touch some point about the car that the owners thought needed attention, was set forth in the letter. It recommended to the owners the following mechanical operations:

"Scrape carbon and grind valves. This operation involves scraping carbon, removing valves, lowering tappets, and grinding valves, replacing same if necessary; cleaning and spacing of spark plugs; cleaning and spacing of magneto points and cleaning of the magneto and

distributing base; also cleaning of the carburetor and gasoline strainers and proper adjustment of the tappet clearance.

"Oil and greasing as per Cleveland or Chandler chart involves the doping of the rear axle, greasing universal joint, doping of transmission, oiling of all brake rods and clevises; oiling of generator, doorkeeper and all spark and throttle joints; greasing differential and removing all possible squeaks from the springs and body at such points as lubrication is necessary.

Tightening car in general calls for the adjusting of all spring shackles; tightening of motor bolts, fender bolts; adjusting tie rod rattles, tightening running board bolts and tightening floor boards; tightening windshield, under-car bolts, nuts and clevises and replacing such as are found necessary.

"Dropping oil pan for inspection and cleaning the same.

"Testing the battery. If it is low the owner is notified.

"Adjusting of both sets of brakes, including setting up of the rear anchor adjustments to proper spacing. This applies to two-wheel brakes."

All of these operations may be obtained for a flat rate of \$20. The offer is good until Jan. 1.

## Gov. Cox Outlines State's Compulsory Insurance Bill

JACKSONVILLE, Fla., Dec. 16.—The question of safety on the highway and compensation for the victims of automobile accidents was discussed at the sixteenth annual conference of Governors held in this city. During the discussion, Governor Cox of Massachusetts outlined a bill now being considered by the Legislature of that state providing for compulsory liability insurance.

Under the bill registration of cars would be limited to applicants who have taken out a liability policy with \$5,000 and \$10,000 limits for personal injuries or death and \$1,000 for property damage, to those who have filed a bond executed by a surety company as security or to those who have made a deposit with a state official of \$6,000 cash or securities out of which demands up to \$5,000 for death or personal injuries and up to \$1,000 for property damages would be satisfied.

Heavy penalties would be provided for operation of an automobile without insurance or for forging evidence of such insurance or bond.

The State Commissioner of Insurance under the proposed law would have broad administrative powers.

## PROPOSES AIR DEPARTMENT

WASHINGTON, Dec. 15.—A bill consolidating the air forces of the army and navy and the creation of a department of aeronautics, to be headed by a new cabinet member, was introduced this week by Congressman Charles F. Curry (R) of California and is aimed at the fostering and development of commercial and defensive aeronautics in this country.

## 35,095 Miles of Aid Roads Now

WASHINGTON, Dec. 15.—A total of 35,095 miles of highways have been constructed since the inauguration of the Federal Aid program, which is being administered by the U. S. Bureau of Public Roads. The progress report of the bureau, as of November 1, shows that this number of miles has been built since 1917, at a total cost of \$395,000,000, approximately half of which has been borne by the Federal government.

In addition to this mileage which has been completed and paid for there are now 19,227 miles under construction.

## Packard Co. Holds Series of Sectional Meetings for Trade

### Gatherings Planned With Idea of Bringing Field Factors Together for Mutual Benefit

DETROIT, Dec. 15.—Packard Motor Car Co. will conclude this month a series of sectional meetings held in seven central cities of the country at which it brought together its entire dealer and distributor organization for purposes of mutual advancement. Through the meetings the company feels it has laid the groundwork for thoroughly progressive merchandising effort in the coming year.

The meetings were held, or will be held before the month closes, in Columbus, Ohio, Cincinnati, Atlanta, Philadelphia, Minneapolis, San Francisco and Dallas, Texas. Each meeting was designed to draw in all the dealers in the defined territories and were arranged both geographically and by program so as to get full attendance at the expense of not more than one day's absence from business.

Dealer problems were considered entirely from the side of what had been accomplished by other dealers under similar conditions, no hard and fast factory recommendations being attempted, but simply an effort made to give all dealers the methods which had been found helpful by the most progressive.

Speakers at the meeting are: R. E. Chamberlain, sales manager; H. N. Davock, technical service manager; J. A. Gilray, in charge of the Packard educational department, and J. W. Loranger, factory financial expert. Alvan Macauley, president of Packard, and Dr. H. H. Hills, vice-president in charge of sales, attended and spoke at as many of the meetings as the pressure of factory work would permit, their talks, however, being mainly on factory policies whereas the other speakers feature every day experiences in the management of an automobile business.

## NASH HAS RECORD NOVEMBER

KENOSHA, Wis., Dec. 13.—Nash sales for November rose 66 per cent beyond the greatest previous November in the history of the Nash Motors Co., a factory statement says. "The month showed an increase of 122.8 per cent over November, 1923," said E. H. McCarty, general sales manager of the Nash Motors Co., "shipments exceeding those of any month this year with the exception of October, which itself showed an increase of 5.6 per cent over the biggest month in the history of Nash Motors.

"November outstripped in point of shipments every month of 1923 except May and June, when the selling season normally is at its peak, and the month just closed also was bigger than any previous November in the history of the Nash Motors Co. by 2,336 cars."



## Wide Variety in Color Effects For License Plates Next Year

List of Combinations Adopted by the  
Different States Compiled  
by A. A. A.

WASHINGTON, Dec. 15.—Almost every known color effect is being used in the new scheme of automobile tags by the different states, some of which, notably Louisiana, will have several different color arrangements for their 1925 tags. In Louisiana, the claim is made that she will have the most elaborate system of tags of any state in the union, having worked out seven different color arrangements.

A compilation of the color schemes for next year, has been worked out by the American Automobile Association. In the list, which follows, the first color is the background, the second being the hue of the lettering and numerals:

Alabama, red-white; Arizona, copper-black; Arkansas, black-silver; California, pneumatic tired commercial vehicle plate, yellow-black; solid tired commercial vehicles, red-white; Colorado, maroon-white; Connecticut, on passenger cars, dark blue-white; Delaware, orange-black; District of Columbia, dark blue-white; Florida, dark green-orange; Georgia, blue-white; Idaho, white-black; Illinois, brown-white; Indiana, ivory-maroon; Iowa, gray-black; Kansas, red-white; Kentucky, green-white; Louisiana, for minimum cars 22 h.p. and under, maroon-white; maximum cars, 23 h.p. and over, gray-red; trucks, yellow-black; dealers, cream-green; school plates, black-yellow; motor cycles, gray-red; animal drawn plates, maroon-white; Maryland, green-white; Maine, white-blue; Massachusetts, black-white; Michigan, taupe gray-black; Minnesota, passenger vehicles, aluminum-black; trucks, trailers, orange-black; dealers, robin's egg blue-black; Mississippi, orange-black; Missouri, dark green-white; Montana, red-white; Nebraska, orange-black; Nevada, blue-white; New Hampshire, white-green; New Jersey, Jersey blue-aluminum; New Mexico, dark blue-white; New York, yellow-black; North Carolina, Chinese blue-white; North Dakota, passenger cars, purple-white; trucks, robin blue-black; Ohio, cream-black; Oklahoma, black aluminum; Oregon, lemon-black; Pennsylvania, blue-gold; Rhode Island, white-black; South Carolina, Shamrock green-white; South Dakota, siennese drab-black; Tennessee, passenger autos, maroon-white; trucks, white-maroon; demonstration plates, dark blue-white; motorcycles, white dark blue; Texas, maroon-white; Utah, Nevada, green-white (correct); Vermont, green-gold; Virginia, white-black; Washington, white-blue; West Virginia, old gold-dark blue; Wisconsin, medium blue-yellow, and Wyoming, white-black.

## Edgar Apperson, Pioneer of Industry, to Occupy Seat of Honor at Show Dinner

KOKOMO, Ind., Dec. 15.—Edgar Apperson of this city will occupy the seat of honor at the manufacturers' dinner at the New York Silver Jubilee Automobile Show in January, a position given him in view of his thirty-two years' active and continuous work in the automotive manufacturing field. It was announced some time ago that guests at the dinner would be seated in accordance with the number of years they had been in business and a survey disclosed the fact that Mr. Apperson is the only manufacturer now actively engaged in the business who participated in the beginning of the industry.

In this connection it has been brought to light that the "dean" of the automobile industry is still comparatively young—57—and still engaged in developing and improving the invention which he so notably helped pioneer. For thirty-two years he has devoted himself to the development of motor cars. It is claimed that the first successful "horseless carriage" was built at Kokomo in 1893. Those who built it were Edgar and Elmer Apperson, Elwood Haynes and John Maxwell. Then the old Haynes-Apperson company was formed.

## SIGN HUPP CONTRACTS

DETROIT, Mich., Dec. 16.—New dealers named by the Hupp Motor Car Corp. are as follows:

J. J. Wiehl Motor Sales Co., Marietta, O.; I. G. Scholl, Napoleon, O.; Hilton & Clute, Corning, N. Y.; Robinson & Burr, Hornell, N. Y.; G. W. Blodgett, Perry, N. Y.; Frank W. Benjamin, Derby, N. Y.; Sterner & Goodfellow, Hanover, Pa.; Shipman Motor Sales Co., Sunbury, Pa.; Bevington, Motor Co., Greenfield, Ia.; J. G. Sherren, Independence, Ia.; Harry Oliver, Arlington, N. J.; L. O. Wade, Eunice, La.; Floyd M. Starkey, Kokomo, Ind.; Frank Klatt, Clyman, Wis.; A. W. Lange, Lake Mills, Wis.; Laurin H. Miller, Oshkosh, Wis.; Oden E. Smith, San Rafael, Cal.; O. H. Bailey, Southington, Conn.; Harry Hornstein, Morris, Minn.; Earl Clapp, Cuba, N. Y.; Berglund's Garage, Albert Lea, Minn.; Service Oil & Garage Co., Cannon Falls, Minn.; Albert La Mac, Lonsdale, Minn.; A. F. Elliott, Milton, N. D.; West Side Garage, Oronoco, Minn.; J. B. Jeffery, Phillips, Wis.; Herron Brothers, Plainview, Minn.; Steffes Garage, Turton, S. D.; Fanucci & Sons, Mountain View, Cal.; Harry Foster & Co., Table Grove, Ill.; S. E. Hess, Glasford, Ill.; Reliance Motor Co., Carthage, Ill.; D. E. Walker, Black Mountains, N. C.; G. Milton Harris, Salem, N. J.; Vineland Auto Exchange, Vineland, N. J.; Rein Motor Company, Riverside, N. J.; A. T. Adkins, Dagsboro, Del.; W. H. Hollis & Son, Preston, Md.; E. H. Doolittle & Sons, Bethany, Conn.; Anderson's Garage, Milford Conn.; Guilford Garage, Guilford, Conn.; C. E. Davis & Son, North Haven, Conn.; W. H. Wallace, North Haven, Conn.; Antonio Pasquarello, Winsted, Conn.; O. H. Bailey, Southington, Conn.; Sanger's Garage, Stafford Springs, Conn.; J. S. Pressler, Montezuma, Ind.; James Fritts, Crawfordsville, Ind.; Thesling & Lady, Richmond, Ind.; Kuntz & Buechler, Jasper, Ind.; Service Garage, Washington, Ind.; Cramer-Austin Sales Co., Princeton, Ind.; Arthur P. Becker, Inc., Cincinnati, O.; John Setuls, Ironwood, Mich.; Niblock & Smith, Glenside, Pa.

## TO INCREASE TIRE OUTPUT

AKRON, O., Dec. 16.—The India Tire & Rubber Co. will increase its production of automobile tires to 1400 tires a day, when a three story addition to the plant here, 96x60 feet, is completed about Jan. 1, according to President J. M. Alderfer. Present production is 1100 tires a day.

## Loose Fitting of Tire Chains Least Damaging Says Company

AKRON, O., Dec. 13.—"Tire chains are entirely proper when used at the right time and in the right manner, but when badly adjusted they furnish a route to ruined tires," says a statement issued this week by engineers of the Miller Rubber Co.

"It is never wise to fasten chains on tightly. The more loosely a chain is applied, the less damage to a tire will result. This is because a loose chain distributes the strain all over the tire instead of at certain points.

"The wise motorist will avoid the use of chains on paved streets, except in case of snow or ice. They are generally unnecessary, and surely will tend toward tire deterioration.

"A tire damaged by chains should go to the repair shop. Too much expert treatment is required to bring its usefulness back, for the motorist to attempt the repairs himself. Only use chains when the condition of the streets requires it, and then see that they are properly applied."

## FORD PLANT STARTS IN SPRING

ST. PAUL, Dec. 15.—Operations in the new \$10,000,000 Ford plant at High Dam will be started about March 1, according to W. B. Mayo, chief engineer of the Ford Motor Co., and manufacturing will be under way by July 1. The assembly division will be the first part of the factory to be opened. Installation of machinery will begin in January.

At the outset about 1600 men will be employed, this number to be augmented by 1000 by the first of July. Manufacturing activities will be gradually expanded and the maximum of employment is expected to be reached in two or three years.

## Coming Motor Events

### Automobile Shows

|                     |                  |  |
|---------------------|------------------|--|
| Allentown, Pa.      | Mar. 1-8         | Allentown Automobile Show, Lehigh Automobile Trade Association, E. T. Satchell, president.   |
| Baltimore           | Jan. 17-24       | Nineteenth Annual Automobile Show, Baltimore Automobile Trade Association  |
| Boston              | March 7-14       | Annual Show, Boston Automobile Dealers' Association, Chester I. Campbell, manager.   |
| Buffalo, N. Y.      | Jan. 10-17       | Twenty-third Annual Automobile Show, Buffalo Automobile Dealers Association, Carlton C. Proctor, manager.  |
| Brooklyn            | Jan. 17-24       | Annual Automobile Show Brooklyn Motor Vehicle Dealers Ass'n.   |
| Charlotte, N. C.    | Feb. 9-14        | Fifth Annual Carolina Automobile Show, B. D. Heath, Chairman Central Committee.  |
| Chicago             | Jan. 23-31, 1925 | National Automobile Chamber of Commerce.   |
| Chicago             | Jan. 26-31       | Twentieth Annual Automobile Salon.   |
| Cincinnati          | Jan. 10-17       | Cincinnati Automobile Show, Music Hall Auditorium, under the auspices of Cincinnati Automobile Dealers Association.  |
| Cleveland, O.       | Jan. 17-24       | Annual Show, Cleveland Automobile Manufacturers' and Dealers' Assn. Public Auditorium, Herbert Buckman, Manager.   |
| Columbus, O.        | Jan. 12-17       | Automobile and Accessory Show of Columbus Automobile Dealers Company.  |
| Des Moines, Ia.     | Feb. 22-28       | Annual Automobile Show Under Auspices of Des Moines Automobile Dealers Association.  |
| Detroit             | Jan. 17-24       | Detroit Automobile Show, Detroit Dealers' Association.   |
| Evansville, Ind.    | Mar. 9-15        | Annual Automobile Show, Evansville Automobile Show Association.  |
| Flint, Mich.        | Feb. 1           | Automobile Show, Flint Dealers Association.  |
| Indianapolis, Ind.  | Mar. 2-7         | Annual Automobile and Accessory Show, Automobile Bldg., Indianapolis Automobile Trade Assn., John Orman, Manager.  |
| Grand Rapids, Mich. | Feb. 9-14        | Annual Automobile Show, Passenger Car Dealers Association, M. D. Elgin, manager.   |
| Kansas City, Mo.    | Feb. 7-14        | Kansas City Motor Car Dealers' Association Show.   |
| Lansing, Mich.      | Feb. 2-7         | Annual Automobile Show, Lansing Automobile Dealers Association, Arthur N. Avery, manager.  |
| Louisville, Ky.     | Feb. 16-21       | Louisville Automobile Show, Louisville Automobile Dealers Association, George T. Holmes, manager.  |
| Montreal            | Jan. 17-24       | National Motor Show of Eastern Canada, Montreal Automobile Trade Association, Ltd., L. M. Hart, president.   |
| Milwaukee           | Jan. 17-24       | Seventeenth Annual Automobile Show, Milwaukee Automotive Dealers Association, Bart J. Ruddle, manager.   |
| Minneapolis         | Jan. 31-Feb. 7   | Eighteenth Annual Twin City Automobile Show, Minneapolis Automobile Trade Association.   |
| Muskegon, Mich.     | Feb. 16-21       | Muskegon Automobile Show, Muskegon Automobile Trade Association, J. C. Fowler, manager.  |
| Newark, N. J.       | Jan. 10-17       | Eighteenth Annual Automobile Show, under the auspices of the New Jersey Automobile Exhibition Co., Chamber of Commerce Building, Claude E. Holgate, Manager.                                     |
| New Bedford, Mass.  | Jan. 23-31, Inc. | Annual Automobile Show given by New Bedford Trade.   |
| New York            | Jan. 2-10, 1925  | National Automobile Chamber of Commerce.   |
| Omaha, Neb.         | Feb. 16-21, 1925 | Twentieth Annual Omaha Automobile Show.  |
| Philadelphia        | Jan. 10-17       | Twenty-fourth Annual Automobile Show, Philadelphia Automobile Trade Association, Commercial Museum.  |
| Pittsfield, Mass.   | Jan. 15-17       | Pittsfield Automobile Show, J. J. Callahan, director.  |
| Pittsburgh, Pa.     | Jan. 31-Feb. 7   | Twenty-ninth Annual Automobile Show, Motor Square Garden, under the auspices of the Automotive Association, Jno. J. Bell, Manager.   |
| Portland, Ore.      | Jan. 31-Feb. 6   | Annual Automobile Show, Multnomah Block, under the auspices of the Automobile Dealers' Association of Portland; Ralph J. Staehli, manager.   |
| Syracuse, N. Y.     | Feb. 2-7         | Seventh Annual Automobile Show, Syracuse Automobile Dealers Association, C. H. Hayes, manager.   |
| San Francisco       | Feb. 21-28       | Ninth Annual Pacific Automobile Show, Exposition Auditorium, under auspices Motor Car Dealers' Association of San Francisco, G. A. Wahlgreen, Manager.   |
| St. Louis, Mo.      | Feb. 21-28       | Annual Automobile Show, St. Louis Automobile Dealers Association, Robert E. Lee, manager.  |
| Washington, D. C.   | Jan. 24-31       | Annual Show to be held on both floors of Convention Hall under auspices Washington Automotive Trade Association, Rudolph Jose, Chairman Show Committee, 1138 Connecticut ave., Washington, D. C. |
| Worcester, Mass.    | Feb. 9-14        | Annual Automobile Show, Worcester Automotive Association, W. R. Livingstone, manager.  |
| Youngstown, Ohio    | Feb. 2-7         | Third Annual Automobile Show, Rayen-Wood Auditorium, Youngstown Automobile Dealers Association, C. A. Baird, manager.  |

### Conventions

|                  |                  |   |
|------------------|------------------|---|
| Chicago          | Jan. 26-29, 1925 | Eight Annual Convention, N. A. D. A., Hotel LaSalle.      |
| Detroit          | Jan. 19-22       | Annual Meeting of the Society of Automotive Engineers.    |
| Montgomery, Ala. | Jan. 26, 1925    | Annual Convention, Alabama Automotive Trades Association. |
| New York City    | Jan. 7, 1925     | New York Show, Convention N. A. D. A., Hotel Commodore.   |

### MAXWELL-CHRYSLER FORCES MEET

DES MOINES, Ia., Dec. 15.—The Manbeck Motor Sales Company recently was host to its organization of 80 Iowa dealers. The occasion was to acquaint the dealers with the new Maxwell line and two recent Chrysler models, The Crown Imperial and the new Club Coupe.

About 180 dealers and employees of dealers were present at the banquet held at the Fort Des Moines Hotel. "Al" Haake, head of the research department of McManus Inc., was the principal speaker. He spoke on Maxwell-Chrysler advertising and salesmanship.

### PRODUCING REGENERATOR

KOKOMO, Ind., Dec. 13.—The Kinston Regenerator, a new product of the Kokomo Electric Co., is now in production. The Regenerator is a device for Ford cars and replaces the regular exhaust and intake manifolds and carbureter, there being no machine work

necessary or holes to drill for the installation. Needle valve and hot air valve are controlled simultaneously through a single dash button. The company's L-4-K Carbureter is the carbureter unit. The device was designed especially for alleviating fuel consumption difficulties in bad weather, the manufacturers say. The Regenerator is not a "hot spot," they say, but has a regenerating pocket in which hot air is mixed with the fuel.

### FIRM HAS 2 DEATHS IN DAY

SALT LAKE CITY, Utah, Dec. 13.—The Weeter-Collett Motor Company of this city lost two of its employees by death in the space of 24 hours. Robert H. Wells, office manager, died suddenly at the home of his mother in Ogden, while Eugene Grady, wholesale manager of the company and widely known in Utah automobile circles, was stricken with illness as he was leaving his home for a business trip dying almost immediately.

### FIRESTONE BUYS SANFORD MILLS

AKRON, Ohio, Dec. 15.—The Firestone Tire & Rubber Co. has purchased the Sanford Cotton Mills in Falls River, Mass., and will operate them as a subsidiary under the name of the Firestone Cotton Mills. The company has been incorporated in Massachusetts for \$5,000,000. Bernard M. Robinson, secretary of the Firestone company is president of the new concern.

Practically all the tire fabric used by the two Firestone Akron plants, the tire manufacturing subsidiary in Massachusetts, and the rubber footwear factory in Massachusetts will be produced by the Fall River textile plant according to the officials.

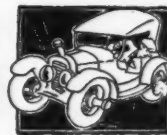
### TAKE STUDEBAKER AGENCY

WATERLOO, Ia., Dec. 12.—The Osburn Motor Car Corporation, recently organized in Waterloo, Ia., has taken over the Studebaker agency in Waterloo, Cedar Rapids and adjacent territory.





# SQUEEKS *and* RATTLES



Back in 1900 the farmer turned up his nose at every automobile. Today he only turns it up at his neighbor's.

A department store advertises the fact that its tintinnabulums have been going like hot cakes. People probably think the store is introducing Europe's promised cheap flivver model.

Two uses for a rope: (A) Lassoing wild horses. (B) Towing tamed automobiles.

Kentucky has a centenarian who has never ridden on a street car, never saw a large city, never saw a movie or tried an ice cream soda—but he has ridden twice in an automobile.

Don't forget that mesh size has a lot to do with the size of your net profits.

## The Sweet Woman

Husband (Jan. 1): "Here's a bill for \$2,200 from the Blank Motor Car Co. Wonder what that is for?"

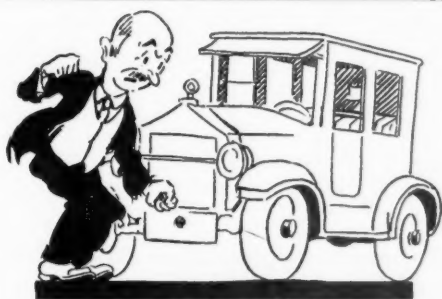
Wife: "It is for the car that I got for your Christmas present, dearie."

One car on the road's worth two in the ditch—But a repairman says that is not so. He'll take the two every time—with a hitch; he does not care for the one on the go. Now, this garageman just fails to decode a little wisdom he surely should know—That the ditched cars must be put on the road before he can collect any dough.

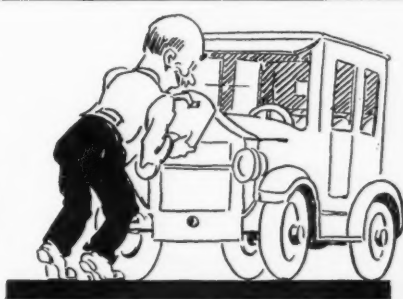
What if the Woolworth building is guilty of swaying a little? That is a natural response to the influence of New York's numerous jazz orchestras.

A waiter has been selling poisoned hooch in the guise of tea. Isn't it time to put a little pep behind the Safe Tea First Movement?

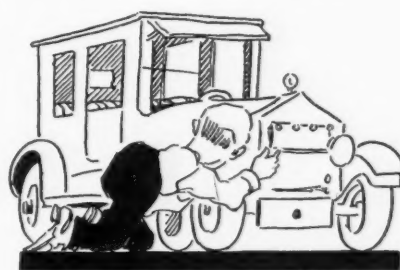
## There's One in Every Block



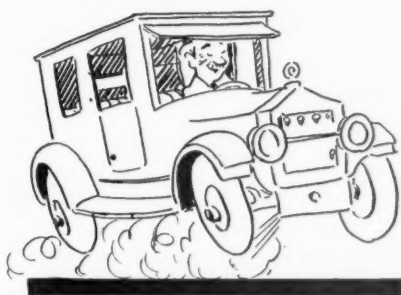
RESOLVES TO TAKE NO CHANCES OF ALLOWING CAR TO FREEZE THIS WINTER



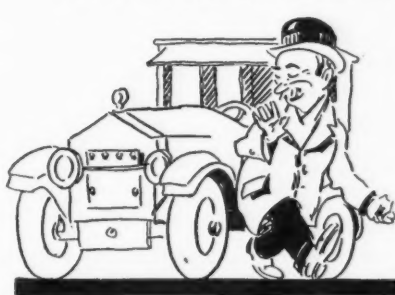
PUTS SOLUTION OF ALCOHOL AND WATER IN RADIATOR AND THINKS HIMSELF PRETTY CLEVER IN FOOLING THE ELEMENTS



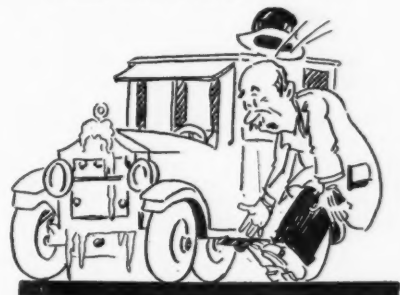
NOT QUITE SATISFIED, BUYS A RADIATOR COVER AND BUTTONS IT UP TIGHT TO KEEP OUT THE COLD AIR.



TAKES LONG TRIP AND FORGETS TO OPEN RADIATOR COVER. CONSEQUENTLY THE ENGINE GETS HOT AND THE ALCOHOL EVAPORATES.



LEAVES CAR OUT IN FREEZING WEATHER AND FIGURES HE IS A PRETTY WISE GUY TO MAKE HIS CAR SO SAFE WITHOUT EXPERT ADVICE.



**BUT!!!!**  
SEVERAL HOURS LATER.

*EDITOR*

# Prices and Weights of Current Passenger Car Models

| Ship.            | Wt. | Pass. | Body Style         | Price   | Ship.            | Wt. | Pass. | Body Style       | Price   | Ship.                         | Wt. | Pass. | Body Style       | Price   | Ship.           | Wt. | Pass. | Body Style       | Price   |
|------------------|-----|-------|--------------------|---------|------------------|-----|-------|------------------|---------|-------------------------------|-----|-------|------------------|---------|-----------------|-----|-------|------------------|---------|
| AMBASSADOR "D-1" |     |       |                    |         |                  |     |       |                  |         | DORRIS                        |     |       |                  |         | GRAY            |     |       |                  |         |
| 3360             |     |       |                    | \$1,695 | 3020             | 3-p |       | Roadster         | 1,670   | 4120                          | 4-p |       | Pasadena Tour.   | \$4,150 | 1750            | 5-p |       | Touring          | \$630   |
| AMERICAN "D-66"  |     |       |                    |         | 3050             | 5-p |       | Touring          | 1,695   | 4115                          | 7-p |       | Touring          | 4,150   | 1785            | 2-p |       | Coupe            | 750     |
| 2985             | 2-p |       | Roadster           | \$1,950 | 3380             | 5-p |       | Sub. Coupe       | 2,390   | 4193                          | 4-p |       | Coupe            | 4,985   | 1880            | 8-p |       | Coupe            | 845     |
| 3175             | 4-p |       | Sp. Roadster       | 2,050   | 3400             | 5-p |       | Sedan            | 2,485   | 4200                          | 5-p |       | Sedan            | 5,550   | 2020            | 5-p |       | Sedan            | 895     |
| 3260             | 5-p |       | Touring            | 1,695   | -----            | 5-p |       | Victoria         | 2,390   | 4310                          | 7-p |       | Sedan            | 5,800   | 2130            | 5-p |       | Sport Sedan      | 995     |
| 3300             | 5-p |       | Sport              | 1,850   |                  |     |       | "Y"              |         | DUESENBERG                    |     |       |                  |         | H C S           |     |       |                  |         |
| 3310             | 7-p |       | Touring            | 1,760   | 3950             | 7-p |       | Touring          | 2,475   | St. "8"                       |     |       |                  |         | 3750            | 4-p |       | Touring          | \$2,650 |
| 3190             | 4-p |       | Sp. Touring        | 1,885   | 4320             | 7-p |       | Sedan            | 3,325   | 3920                          | 3-p |       | Roadster         | \$6,500 | 3950            | 4-p |       | Coupe            | 3,350   |
| 3470             | 7-p |       | Sedan              | 2,550   | CHANDLER "SS"    |     |       |                  |         | 3920                          | 7-p |       | Phaeton          | 6,750   | 4010            | 4-p |       | Sedan            | 3,350   |
| 3310             | 5-p |       | Brougham           | 2,195   | 3090             | 2-p |       | Roadster         | \$1,795 | 3980                          | 4-p |       | Sp. Phaeton      | 6,500   |                 |     |       |                  |         |
| ANDERSON         |     |       |                    |         | 3132             | 4-p |       | Roadster         | 1,785   | 4000                          | 4-p |       | Coupe            | 7,500   | HATFIELD        |     |       |                  |         |
| 2650             | 5-p |       | Touring            | \$1,195 | 3084             | 5-p |       | Touring          | 1,585   | 4350                          | 7-p |       | Sedan            | 7,800   | "6-55"          |     |       |                  |         |
| 2675             | 4-p |       | Sp. Touring        | 1,445   | 3223             | 7-p |       | Touring          | 1,735   | DU PONT                       |     |       |                  |         | 3080            | 4-p |       | Sport Touring    | \$1,775 |
| 2925             | 2-p |       | Coupe              | 1,425   | 3284             | 4-p |       | Royal Dispatch   | 1,885   | 3300                          | 2-p |       | Roadster         | ††----- | 3225            | 4-p |       | Coupe            | 2,175   |
| 2875             | 5-p |       | Sedan              | 1,695   | 3309             | 5-p |       | Chummy Sedan     | 2,045   | 3400                          | 5-p |       | Touring          | ††----- | 3300            | 5-p |       | Sedan            | 2,350   |
| 2925             | 5-p |       | Sp. Sedan          | 1,895   | 3469             | 5-p |       | Met. Sedan       | 2,195   | 3600                          | 5-p |       | Touring Sedan    | ††----- | HAYNES          |     |       |                  |         |
| "50"             |     |       |                    |         | 3428             | 5-p |       | Sedan            | 1,995   | 3600                          | 5-p |       | Sub'n Sedan      | ††----- | 3295            | 5-p |       | Touring          | \$1,600 |
| 2975             | 7-p |       | Touring            | 1,595   | 3521             | 7-p |       | Sedan            | 2,195   | DURANT                        |     |       |                  |         | 3725            | 5-p |       | Sedan            | 2,300   |
| 3200             | 7-p |       | Sedan              | 1,945   | 3598             | 7-p |       | Limousine        | 3,095   | "A-22"                        |     |       |                  |         | 3560            | 5-p |       | Brougham         | 2,200   |
| APPERSON         |     |       |                    |         | CHEVROLET        |     |       |                  |         | 2235                          | 2-p |       | Roadster         | \$1,080 | HUDSON          |     |       |                  |         |
| 3100             | 5-p |       | Sp. Phaeton        | \$1,695 | "Superior"       |     |       |                  |         | 2325                          | 5-p |       | Touring          | 830     | "Super Six"     |     |       |                  |         |
| 3145             | 3-p |       | Coupe              | 1,985   | 1690             | 2-p |       | Roadster         | \$495   | 2345                          | 5-p |       | Touring F.W.B.   | 940     | 3300            | 4-p |       | Speedster        | \$1,400 |
| 3280             | 5-p |       | Sedan              | 2,095   | 1790             | 5-p |       | Touring          | 510     | 2405                          | 2-p |       | Business Coupe   | 935     | 3425            | 7-p |       | Phaeton          | 1,500   |
| 3470             | 5-p |       | Sp. Sedan          | 2,295   | 1955             | 5-p |       | Phaeton DeLuxe   | 640     | 2495                          | 4-p |       | Coupe            | 1,160   | 3450            | 5-p |       | Coach            | 1,845   |
| "8"              |     |       |                    |         | 2005             | 4-p |       | Coupe            | 725     | 2605                          | 5-p |       | Sedan            | 1,190   | 3585            | 5-p |       | Sedan            | 1,795   |
| 3815             | 5-p |       | Phaeton            | \$2,485 | -----            | 4-p |       | Coupe DeLuxe     | 775     | 2650                          | 5-p |       | Coach            | 1,050   | 3675            | 7-p |       | Sedan            | 1,895   |
| 3900             | 7-p |       | Phaeton            | 2,535   | 1880             | 2-p |       | Utility Coupe    | 640     | ELCAR                         |     |       |                  |         | HUPMOBILE       |     |       |                  |         |
| 3955             | 5-p |       | Sport Phaeton      | 2,800   | -----            | 5-p |       | Coach            | 695     | 2560                          | 5-p |       | Touring          | \$995   | 2595            | 2-p |       | Roadster         | \$1,225 |
| 3815             | 7-p |       | Sport Phaeton      | 2,900   | 2070             | 5-p |       | Sedan            | 795     | 2585                          | 5-p |       | Demi Sp. Touring | 1,095   | 2730            | 5-p |       | Touring          | 1,225   |
| 4180             | 5-p |       | Sedan              | 3,485   | -----            | 5-p |       | Sedan DeLuxe     | 940     | 2641                          | 5-p |       | Sportster        | 1,195   | 2760            | 2-p |       | Coupe            | 1,350   |
| 4200             | 7-p |       | Sedan              | 3,585   | CHRYSLER         |     |       |                  |         | 2779                          | 5-p |       | Sedan 3 d.       | 1,295   | 2860            | 4-p |       | Coupe            | 1,595   |
| 4340             | 5-p |       | Sport Sedan        | 3,750   | (112½ in. W. B.) |     |       |                  |         | 2900                          | 5-p |       | Sedan            | 1,495   | 2975            | 5-p |       | Sedan            | 1,800   |
| 4380             | 7-p |       | Sport Sedan        | 3,850   | 2805             | 4-p |       | Roadster         | \$1,625 | 2981                          | 5-p |       | Sp. Sedan        | 1,695   | 2895            | 5-p |       | Club Sedan       | 1,375   |
| AUBURN           |     |       |                    |         | 2730             | 5-p |       | Touring          | 1,395   | 2779                          | 5-p |       | Brougham 3 d.    | 1,265   | JEWETT          |     |       |                  |         |
| "6-43"           |     |       |                    |         | 2785             | 5-p |       | Phaeton          | 1,495   | 2829                          | 5-p |       | Sp. Brough. 3 d. | 1,395   | 2690            | 5-p |       | Touring          | \$1,135 |
| 2610             | 5-p |       | Special Touring    | \$1,395 | 2935             | 4-p |       | Coupe            | 1,895   | "6-50-51"                     |     |       |                  |         | 2810            | 5-p |       | DeLuxe Touring   | 1,290   |
| 2760             | 5-p |       | Sp. Touring        | 1,465   | 3060             | 5-p |       | Sedan            | 1,825   | 2600                          | 5-p |       | Demi Sp. Tour.   | 1,220   | -----           | 3-p |       | Bus. Coupe       | 1,310   |
| -----            | 5-p |       | Touring Coupe      | 1,695   | 3085             | 5-p |       | Imperial Sedan   | 2,065   | 2690                          | 5-p |       | Sp. Touring      | 1,420   | 2880            | 5-p |       | Sedan            | 1,545   |
| 2900             | 5-p |       | English Coach      | 1,945   | 3090             | 5-p |       | Crown Sedan      | 2,195   | 2779                          | 5-p |       | Sedan 3 d.       | 1,495   | 3095            | 5-p |       | DeLuxe Sedan     | 1,745   |
| 2885             | 5-p |       | Sedan              | 1,795   | 3995             | 5-p |       | Brougham         | 1,965   | 2900                          | 5-p |       | Sedan            | 1,720   | 2775            | 5-p |       | Brougham         | 1,385   |
| "8-63"           |     |       |                    |         | -----            | 5-p |       | Town Car         | 3,725   | 2981                          | 5-p |       | Sp. Sedan        | 1,920   | -----           | 5-p |       | Sp. Brougham     | 1,525   |
| 3225             | 5-p |       | Sp. Touring        | 1,895   | CLEVELAND        |     |       |                  |         | 2779                          | 5-p |       | Brougham         | 1,490   | JORDAN          |     |       |                  |         |
| 3550             | 5-p |       | Sedan              | 2,550   | "43"             |     |       |                  |         | 2829                          | 5-p |       | Sp. Brougham     | 1,620   | (120 in. W. B.) |     |       |                  |         |
| 3510             | 5-p |       | Brougham           | 2,395   | 2750             | 5-p |       | Touring          | \$1,095 | 2007                          | 5-p |       | Touring          | 1,585   | 3420            | 5-p |       | Brougham 4 d.    | \$2,385 |
| 3550             | 7-p |       | Sedan              | 2,550   | 2810             | 5-p |       | Touring De Luxe  | 1,195   | 3380                          | 5-p |       | Sedan            | 2,245   | 3875            | 4-p |       | Victoria         | 2,385   |
| BARLEY           |     |       |                    |         | 2830             | 3-p |       | Coupe            | 1,295   | 3675                          | 5-p |       | Sp. Sedan        | 2,395   | -----           | 4-p |       | (124½ in. W. B.) |         |
| "6-50"           |     |       |                    |         | 2870             | 3-p |       | Spec. Coupe      | 1,395   | 3880                          | 4-p |       | Brougham         | 1,995   | 3260            | 4-p |       | Blueboy Touring  | 2,095   |
| 2750             | 5-p |       | Touring            | \$1,395 | 3040             | 5-p |       | Spec. Sedan 4 d. | 1,495   | 3000                          | 3-p |       | Roadster         | 2,315   | Series "A"      |     |       |                  |         |
| 2800             | 5-p |       | Sp. Touring        | 1,495   | 3090             | 5-p |       | Sedan de Luxe    | 1,695   | 3700                          | 5-p |       | Sp. Touring      | 2,165   | 3330            | 2-p |       | Playboy Road.    | 2,575   |
| 3100             | 5-p |       | Sedan              | 1,850   | 2930             | 5-p |       | Brougham         | 1,545   | -----                         | 7-p |       | Sp. Touring      | 2,265   | 3340            | 5-p |       | Touring          | 2,575   |
| 3150             | 5-p |       | Sp. Sedan          | 2,250   | COLE "MASTER"    |     |       |                  |         | 4000                          | 5-p |       | Sedan            | 2,865   | 3635            | 5-p |       | Brougham         | 2,875   |
| BUICK            |     |       |                    |         | 3675             | 4-p |       | Volante Tour.    | \$2,325 | 4050                          | 7-p |       | Sedan            | 2,765   | 3520            | 4-p |       | Victoria         | 2,775   |
| "Standard"       |     |       |                    |         | 3795             | 7-p |       | West. Tour.      | 2,325   | ESSEX                         |     |       |                  |         | 3525            | 5-p |       | Sedan            | 2,975   |
| 2750             | 2-p |       | Roadster           | \$1,150 | 3675             | 4-p |       | Aero-Vol. Tour.  | 2,475   | 2130                          | 5-p |       | Touring          | \$900   | KING            |     |       |                  |         |
| 2800             | 2-p |       | Roadster Encl.     | 1,190   | 4055             | 5-p |       | Brouette Sedan   | 3,225   | 2305                          | 5-p |       | Coach            | 895     | (120 in. W. B.) |     |       |                  |         |
| 2920             | 5-p |       | Touring            | 1,175   | 4000             | 7-p |       | Royal Limousine  | 3,325   | FLINT                         |     |       |                  |         | 3428            | 2-p |       | Sportster        | \$1,895 |
| 2970             | 5-p |       | Touring Encl.      | 1,250   | CUNNINGHAM       |     |       |                  |         | 3095                          | 3-p |       | Sp. Roadster     | \$1,630 | 3428            | 4-p |       | Foursome         | 1,595   |
| 2960             | 2-p |       | Coupe              | 1,375   | "V-4"            |     |       |                  |         | 3145                          | 5-p |       | Touring          | 1,495   | 3528            | 5-p |       | Touring          | 1,595   |
| 3075             | 4-p |       | Coupe              | 1,565   | 4600             | 7-p |       | Touring          | \$6,300 | 3165                          | 5-p |       | Sp. Touring      | 2,050   | 3645            | 3-p |       | Coupe            | 2,200   |
| 3185             | 5-p |       | Dbi. Service Sedan | 1,475   | 4700             | 4-p |       | Coupe            | 7,150   | 3355                          | 4-p |       | Coupe            | 2,095   | 3875            | 5-p |       | Sedan            | 2,400   |
| 3245             | 5-p |       | Sedan              | 1,665   | 5000             | 6-p |       | Sedan            | 7,650   | 3470                          | 4-p |       | Sedan            | 2,185   | 3400            | 5-p |       | Road King Sedan  | 1,495   |
| 3050             | 5-p |       | Coach              | 1,295   | DAGMAR           |     |       |                  |         | 2400                          | 5-p |       | Touring          | 1,075   | -----           | 4-p |       | Sedanette        | 1,995   |
| "Master"         |     |       |                    |         | "6-70"           |     |       |                  |         | 2720                          | 5-p |       | Brougham         | 1,640   | KISSEL          |     |       |                  |         |
| (120 in. W. B.)  |     |       |                    |         | 3800             | 4-p |       | Sp. Touring      | \$3,500 | FORD                          |     |       |                  |         | 2980            | 5-p |       | Phaeton Std.     | \$1,685 |
| 3285             | 2-p |       | Roadster           | \$1,365 | 4200             | 4-p |       | Sedan            | 4,500   | Without Starter and Dem. Rims |     |       |                  |         | 3170            | 5-p |       | Phaeton DeLuxe   | 1,885   |
| 3335             | 2-p |       | Roadster Encl.     | 1,400   | DANIELS          |     |       |                  |         | 1395                          | 2-p |       | Runabout         | \$260   | 3190            | 5-p |       | Tourster         | 2,085   |
| 3465             | 5-p |       | Touring            | 1,395   | "24-38"          |     |       |                  |         | 1517                          | 5-p |       | Touring          | 290     | 3130            | 2-p |       | Speedster        | 2,135   |
| 3540             | 5-p |       | Touring Encl.      | 1,475   | 4150             | 4-p |       | Touring          | \$6,800 | With Starter and Dem. Rims    |     |       |                  |         | 3530            | 2-p |       | Enc. Speedster   | 2,785   |
| 3770             | 4-p |       | Coupe              | 2,125   | 4765             | 7-p |       | Touring          | 6,900   | 1540                          | 2-p |       | Runabout         | 345     | 3430            | 4-p |       | Coupe            | 2,585   |
| 3850             | 5-p |       | Sedan              | 2,225   | 4600             | 4-p |       | Sedan            | 7,600   | 1662                          | 5-p |       | Touring          | 375     | 3530            | 5-p |       | Brougham         | 2,685   |
| 3560             | 5-p |       | Coach              | 1,495   | 5200             | 7-p |       | Sedan            | 7,800   | 1772                          | 2-p |       | Coupe            | 520     | 3530            | 5-p |       | Sedan            | 2,585   |
| (128 in. W. B.)  |     |       |                    |         | DAVIS            |     |       |                  |         | 1950                          | 5-p |       | Sedan, Fordor    | 660     | 4970            | 7-p |       | Sedan            | 3,385   |
| 3485             | 3-p |       | Sp. Roadster       | \$1,750 | "90"             |     |       |                  |         | 1898                          | 5-p |       | Sedan, Tudor     | 580     | 4010            | 7-p |       | Berline Sedan    | 3,485   |
| 3550             | 5-p |       | Sp. Touring        | 1,800   | 2650             | 4-p |       | M. O'War Road.   | 1,495   | FRANKLIN                      |     |       |                  |         | LEXINGTON       |     |       |                  |         |
| 3610             | 7-p |       | Touring            | 1,625   | 2915             | 4-p |       | Legionaire Tour. | 1,495   | "10 C"                        |     |       |                  |         | "Concord"       |     |       |                  |         |
| 3690             | 7-p |       | Touring Encl.      | 1,700   | 2750             | 5-p |       | Phaeton          | 1,395   | 2700                          | 5-p |       | Touring          | \$1,950 | -----           | 5-p |       | Touring          | \$1,595 |
| 3745             | 3-p |       | Country Club       | 2,075   | 3070             | 5-p |       | Sedan            | 1,995   | 2835                          | 4-p |       | Coupe            | 2,750   | -----           | 5-p |       | Touring (Enc.)   | 1,695   |
| 3905             | 5-p |       | Brougham Club      | 2,350   | 3065             | 5-p |       | Berline Sedan    | 1,995   | 2860                          | 5-p |       | Sedan            | 2,850   | -----           | 5-p |       | Spec. Touring    | 1,795   |
| 4030             | 7-p |       | Limousine          | 2,525   | 2700             | 5-p |       | Brougham         | 1,595   | 2770                          | 5-p |       | Demi-Sedan       | 2,250   | -----           | 5-p |       | Sedan            | 2,185   |
| 3995             | 7-p |       | Sedan              | 2,425   | 2835             | 4-p |       | Roadster         | 1,795   | 2880                          | 5-p |       | Brougham         | 2,850   | "Minute Man"    |     |       |                  |         |
| 3850             | 7-p |       | Town Car           | 2,925   | 3020             | 5-p |       | Phaeton          | 1,695   | -----                         | 5-p |       | Touring Lim.     | 2,950   | -----           | 2-p |       | Roadster         | 2,145   |
| CADILLAC         |     |       |                    |         | 3245             | 5-p |       | Sedan            | 2,295   | GARDNER                       |     |       |                  |         | -----           | 5-p |       | Touring          | 2,095   |
| "V-63"           |     |       |                    |         | 3050             | 5-p |       | Brougham         | 1,895   | 2520                          | 3-p |       | Roadster         | \$945   | -----           | 5-p |       | Lark Touring     | 2,345   |
| 4190             | 4-p |       | Roadster           | \$3,185 | 3215             | 5   |       |                  |         |                               |     |       |                  |         |                 |     |       |                  |         |



## Prices and Weights of Current Passenger Car Models

| Ship.           |       |                  |         |  |
|-----------------|-------|------------------|---------|--|
| Wt.             | Pass. | Body Style       | Price   |  |
| LINCOLN         |       |                  |         |  |
| 4050            | 2-p   | Roadster         | \$4,000 |  |
| 4290            | 7-p   | Touring          | 4,000   |  |
| 4215            | 4-p   | Phaeton          | 4,000   |  |
| 4380            | 5-p   | Coupe            | 4,600   |  |
| 4375            | 4-p   | Sedan            | 4,800   |  |
| 4600            | 5-p   | Sedan            | 4,900   |  |
| 4660            | 7-p   | Sedan            | 5,100   |  |
| 4720            | 7-p   | Limousine        | 5,300   |  |
| LOCOMOBILE      |       |                  |         |  |
| "48"            |       |                  |         |  |
| 5030            | 4-p   | Sportif Tour.    | \$7,400 |  |
| 5330            | 7-p   | Touring          | 7,400   |  |
| 5600            | 5-p   | Victoria Sedan   | 9,900   |  |
| 5464            | 7-p   | Brougham         | 9,990   |  |
| 5640            | 7-p   | Tour. Limousine  | 9,000   |  |
| 5868            | 7-p   | Encl. Drive Lim. | 9,990   |  |
| 5624            | 7-p   | Cabriolet        | 10,250  |  |
| McFARLAN        |       |                  |         |  |
| "6" TV          |       |                  |         |  |
| 4600            | 2-p   | Roadster         | \$5,400 |  |
| 4600            | 4-p   | Sport Touring    | 5,600   |  |
| 4700            | 7-p   | Touring          | 5,700   |  |
| 4900            | 4-p   | Coupe            | 6,720   |  |
| 5200            | 5-p   | Tour. Sedan      | 6,720   |  |
| 5200            | 7-p   | Tour. Sedan      | 6,810   |  |
| 5200            | 7-p   | Sp. Sedan        | 6,600   |  |
| 5200            | 7-p   | Sub. Sedan       | 7,000   |  |
| 5100            | 7-p   | Limousine        | 6,900   |  |
| 5200            | 7-p   | Town Car         | 9,000   |  |
| "Light 6" SV    |       |                  |         |  |
| 3700            | 3-p   | Roadster         | 2,600   |  |
| 3700            | 5-p   | Touring          | 2,600   |  |
| 3850            | 4-p   | Coupe            | 3,100   |  |
| 3850            | 5-p   | Sedan            | 3,100   |  |
| 3900            | 7-p   | Sedan            | 3,200   |  |
| MARMON          |       |                  |         |  |
| "74"            |       |                  |         |  |
| 3470            | 2-p   | Roadster         | \$3,165 |  |
| 3575            | 5-p   | Phaeton          | 3,165   |  |
| 3690            | 7-p   | Touring          | 3,165   |  |
| 3770            | 5-p   | Brougham Coupe   | 3,295   |  |
| 3970            | 5-p   | Coupe de Luxe    | 3,455   |  |
| 3970            | 5-p   | Sedan            | 3,295   |  |
| 4155            | 7-p   | Sedan de Luxe    | 3,775   |  |
| 4000            | 7-p   | Sedan de Luxe    | 3,850   |  |
| 4100            | 7-p   | Sedan Limousine  | 3,900   |  |
| 4100            | 7-p   | Sedan Limousine  | 3,975   |  |
| MAXWELL         |       |                  |         |  |
| "25"            |       |                  |         |  |
| 2135            | 2-p   | Roadster         | \$885   |  |
| 2210            | 5-p   | Touring          | 895     |  |
| 2410            | 5-p   | Sp. Touring      | 1,055   |  |
| 2255            | 2-p   | Club Coupe       | 1,025   |  |
| 2440            | 5-p   | Club Sedan       | 1,095   |  |
| 2595            | 5-p   | Sedan            | 1,345   |  |
| 2785            | 5-p   | Trav. Sedan      | 1,585   |  |
| MOON            |       |                  |         |  |
| Series "A"      |       |                  |         |  |
| 2440            | 4-p   | Roadster         | \$1,295 |  |
| 2460            | 5-p   | Sp. Touring      | 1,195   |  |
| 2605            | 5-p   | Sedan 2 d        | 1,495   |  |
| 2755            | 5-p   | Petite Sedan 4d  | 1,785   |  |
| Newport         |       |                  |         |  |
| 2760            | 5-p   | Touring          | 1,495   |  |
| 2920            | 5-p   | Sedan            | 1,815   |  |
| 3090            | 5-p   | Petite Sedan     | 1,915   |  |
| Metropolitan    |       |                  |         |  |
| 2860            | 5-p   | Touring          | 1,515   |  |
| 3120            | 5-p   | Sedan            | 1,995   |  |
| 3190            | 5-p   | Sp. Sedan        | 2,095   |  |
| London          |       |                  |         |  |
| 3270            | 5-p   | Sp. Touring      | 1,985   |  |
| 3590            | 5-p   | Petite Sedan     | 2,540   |  |
| NASH            |       |                  |         |  |
| "Special"       |       |                  |         |  |
| 2960            | 5-p   | Touring          | \$1,095 |  |
| 3120            | 5-p   | Sedan            | 1,295   |  |
| "Advanced"      |       |                  |         |  |
| (121 in. W. B.) |       |                  |         |  |
| 3320            | 3-p   | Roadster         | 1,375   |  |
| 3400            | 5-p   | Touring          | 1,375   |  |
| 3680            | 5-p   | Sedan            | 1,695   |  |
| "Advanced"      |       |                  |         |  |
| (127 in. W. B.) |       |                  |         |  |
| 3480            | 7-p   | Touring          | 1,525   |  |
| 3830            | 7-p   | Sedan            | 2,290   |  |
| 3750            | 5-p   | Coupe 4 d.       | 2,190   |  |
| OAKLAND         |       |                  |         |  |
| "6-54"          |       |                  |         |  |
| 2420            | 3-p   | Roadster         | \$1,095 |  |
| 2510            | 3-p   | Sp. Roadster     | 1,195   |  |
| 2485            | 5-p   | Touring          | 1,095   |  |
| 2550            | 5-p   | Sp. Touring      | 1,195   |  |
| 2620            | 5-p   | Coach            | 1,215   |  |
| 2620            | 3-p   | Landau Coupe     | 1,295   |  |
| 2720            | 4-p   | Coupe            | 1,495   |  |
| 2860            | 5-p   | Sedan            | 1,545   |  |
| 2885            | 5-p   | Landau Sedan     | 1,645   |  |

| Ship.                    |       |                 |         |  |
|--------------------------|-------|-----------------|---------|--|
| Wt.                      | Pass. | Body Style      | Price   |  |
| OLDSMOBILE               |       |                 |         |  |
| "30"                     |       |                 |         |  |
| 2145                     | 2-p   | Roadster        | \$875   |  |
| 2270                     | 2-p   | Sp. Roadster    | 985     |  |
| 2200                     | 5-p   | Touring         | 875     |  |
| 2360                     | 5-p   | Sp. Touring     | 1,015   |  |
| 2330                     | 2-p   | Bus. Coupe      | 1,045   |  |
| 2460                     | 4-p   | Coupe           | 1,175   |  |
| 2410                     | 5-p   | Coach           | 1,065   |  |
| 2570                     | 5-p   | Sedan           | 1,250   |  |
| 2740                     | 5-p   | DeLuxe Sedan    | 1,350   |  |
| OVERLAND                 |       |                 |         |  |
| "91" (100 in. wheelbase) |       |                 |         |  |
| 1769                     | 2-p   | Roadster        | \$530   |  |
| 1863                     | 5-p   | Touring         | 530     |  |
| 1918                     | 5-p   | Touring DeLuxe  | 595     |  |
| 2177                     | 2-p   | Coupe           | 695     |  |
| 2130                     | 5-p   | Sedan           | 850     |  |
| 2094                     | 5-p   | Coupe Sedan     | 585     |  |
| "92" (106 in. W. B.)     |       |                 |         |  |
| 2044                     | 5-p   | Blue Bird       | 725     |  |
| PACKARD                  |       |                 |         |  |
| "6" (126 in. W. B.)      |       |                 |         |  |
| 3165                     | 4-p   | Roadster        | \$2,785 |  |
| 3320                     | 5-p   | Touring         | 2,585   |  |
| 3255                     | 4-p   | Sp. Touring     | 2,750   |  |
| 3400                     | 4-p   | Coupe           | 3,275   |  |
| 3515                     | 5-p   | Coupe           | 3,450   |  |
| 3565                     | 5-p   | Sedan           | 3,375   |  |
| 3610                     | 5-p   | Sedan Limousine | 3,425   |  |
| "6" (133 in. W. B.)      |       |                 |         |  |
| 3430                     | 7-p   | Touring         | 2,785   |  |
| 3690                     | 7-p   | Sedan           | 3,625   |  |
| 8765                     | 7-p   | Sedan Limousine | 3,675   |  |
| "8" (136 in. W. B.)      |       |                 |         |  |
| 3880                     | 4-p   | Runabout        | 3,850   |  |
| 3990                     | 5-p   | Touring         | 3,650   |  |
| 3930                     | 4-p   | Sp. Touring     | 3,800   |  |
| 4125                     | 4-p   | Coupe           | 4,550   |  |
| 4200                     | 5-p   | Coupe           | 4,725   |  |
| 4270                     | 5-p   | Sedan           | 4,650   |  |
| 4275                     | 5-p   | Sedan Limousine | 4,700   |  |
| "8" (143 in. W. B.)      |       |                 |         |  |
| 4020                     | 7-p   | Touring         | 3,850   |  |
| 4275                     | 7-p   | Sedan           | 4,900   |  |
| 4350                     | 7-p   | Sedan-Limousine | 4,950   |  |
| PAIGE                    |       |                 |         |  |
| 3677                     | 4-p   | Phaeton         | \$1,895 |  |
| 3742                     | 7-p   | Phaeton         | 1,895   |  |
| 3880                     | 4-p   | Phaeton DeLuxe  | 2,095   |  |
| 3900                     | 5-p   | Brougham 4 d.   | 2,175   |  |
| 4285                     | 7-p   | Sedan DeLuxe    | 2,770   |  |
| 4300                     | 7-p   | Sub. Limousine  | 2,895   |  |
| PEERLESS                 |       |                 |         |  |
| "6-70"                   |       |                 |         |  |
| 3050                     | 2-p   | Roadster        | \$2,350 |  |
| 3175                     | 5-p   | Touring         | 2,285   |  |
| 3525                     | 7-p   | Touring         | 2,485   |  |
| 3700                     | 5-p   | Coupe           | 2,950   |  |
| 3550                     | 5-p   | Sedan           | 2,995   |  |
| 3900                     | 7-p   | Sedan           | 3,295   |  |
| Equiposed "8"            |       |                 |         |  |
| 4300                     | 4-p   | Tour. Phaeton   | 3,285   |  |
| 4300                     | 5-p   | Town Brougham   | 4,250   |  |
| 4355                     | 7-p   | Sub. Sedan      | 4,450   |  |
| 4430                     | 7-p   | Berline Lim.    | 4,725   |  |
| 4130                     | 4-p   | Victoria Coupe  | 3,950   |  |
| 4175                     | 5-p   | Coupe           | 4,175   |  |
| PIERCE-ARROW             |       |                 |         |  |
| "33"                     |       |                 |         |  |
| 4350                     | 2-p   | Runabout        | \$5,250 |  |
| 4590                     | 5-p   | Touring         | 5,250   |  |
| 4780                     | 3-p   | Coupe           | 6,800   |  |
| 4830                     | 4-p   | Sedan           | 6,900   |  |
| 4960                     | 7-p   | Sedan           | 7,000   |  |
| 4750                     | 4-p   | Coupe Sedan     | 6,900   |  |
| 4730                     | 6-p   | Brougham        | 6,800   |  |
| 4850                     | 7-p   | Limousine       | 7,000   |  |
| 5060                     | 7-p   | Enclosed Lim.   | 7,000   |  |
| 4780                     | 7-p   | French Lim.     | 7,000   |  |
| 4732                     | 6-p   | Landaulet       | 7,000   |  |
| "80"                     |       |                 |         |  |
| 3385                     | 7-p   | Phaeton         | 2,895   |  |
| 3440                     | 5-p   | Sedan           | 3,895   |  |
| 3625                     | 7-p   | Sedan           | 3,995   |  |
| 3675                     | 7-p   | Enc. Drive Lim. | 4,045   |  |
| REO                      |       |                 |         |  |
| "T-6"                    |       |                 |         |  |
| 3172                     | 5-p   | Sta. Touring    | \$1,395 |  |
| 3182                     | 5-p   | Sport Touring   | 1,595   |  |
| 3325                     | 4-p   | Coupe           | 1,875   |  |
| 3515                     | 5-p   | Coupe           | 1,975   |  |
| 3515                     | 5-p   | Sedan 4 d.      | 1,595   |  |
| 3515                     | 5-p   | Sedan           | 1,985   |  |
| 3965                     | 5-p   | Sedan           | 2,085   |  |
| 3965                     | 5-p   | Brougham 4 d.   | 2,235   |  |
| REVERE                   |       |                 |         |  |
| "25"                     |       |                 |         |  |
| 3900                     | 2-p   | Roadster        | \$2,750 |  |
| 3975                     | 4-p   | Speedster       | 2,750   |  |
| 4050                     | 5-p   | Touring         | 2,750   |  |
| 4300                     | 5-p   | Sedan           | 3,800   |  |

| Ship.                                     |       |                  |         |  |
|---|-------|------------------|---------|--|
| Wt.                                       | Pass. | Body Style       | Price   |  |
| RICKENBACKER                              |       |                  |         |  |
| "C"                                       |       |                  |         |  |
| 2815                                      | 3-p   | Sp. Roadster     | \$1,645 |  |
| 2880                                      | 5-p   | Sp. Touring      | 1,595   |  |
| 3050                                      | 4-p   | Coupe            | 2,095   |  |
| 3160                                      | 5-p   | Sedan            | 2,195   |  |
| "A"                                       |       |                  |         |  |
| 3326                                      | 4-p   | Sport Phaeton    | 2,195   |  |
| 3440                                      | 4-p   | Coupe            | 2,695   |  |
| 3585                                      | 5-p   | Sedan            | 2,795   |  |
| ROAMER                                    |       |                  |         |  |
| "6-54-E" (118 in. W. B.)                  |       |                  |         |  |
| 3100                                      | 2-p   | Roadster         | \$2,685 |  |
| 3100                                      | 4-p   | Tourer           | 2,485   |  |
| 3300                                      | 4-p   | Sp. Touring      | 2,750   |  |
| 3300                                      | 7-p   | Touring          | 2,685   |  |
| 3300                                      | 3-p   | Cabriolet        | 3,285   |  |
| "6-54-E" (138 in. W. B.)                  |       |                  |         |  |
| 4100                                      | 5-p   | Spec. Sedan      | 4,250   |  |
| 4200                                      | 7-p   | Suburban-Sedan   | 3,950   |  |
| "4-75-E"                                  |       |                  |         |  |
| 3650                                      | 4-p   | Sport            | 3,650   |  |
| "4-85-E"                                  |       |                  |         |  |
| 3200                                      | 2-p   | Spec. Speedster  | 3,785   |  |
| ROLLIN                                    |       |                  |         |  |
| 2300                                      | 5-p   | Touring          | \$995   |  |
| 2315                                      | 3-p   | Coupe Roadster   | 1,195   |  |
| 2425                                      | 3-p   | Spec. Coupe      | 1,395   |  |
| 2485                                      | 5-p   | Sedan            | 1,295   |  |
| 2595                                      | 5-p   | Spec. Sedan      | 1,550   |  |
| ROLLS ROYCE                               |       |                  |         |  |
| Chassis                                   |       |                  |         |  |
| ††Manufacturers do not quote list prices. |       |                  |         |  |
| STANLEY                                   |       |                  |         |  |
| "252"                                     |       |                  |         |  |
| 3770                                      | 5-p   | Phaeton          | \$2,500 |  |
| 3910                                      | 7-p   | Phaeton          | 2,750   |  |
| 4075                                      | 5-p   | Sedan            | 3,300   |  |
| 4170                                      | 7-p   | Sedan            | 3,985   |  |
| STAR                                      |       |                  |         |  |
| 1700                                      | 2-p   | Roadster         | \$540   |  |
| 1790                                      | 5-p   | Touring          | 540     |  |
| 1800                                      | 5-p   | Touring FWB      | 745     |  |
| 1880                                      | 5-p   | Spec. Touring    | 795     |  |
| 1980                                      | 2-p   | Coupe            | 750     |  |
| 2115                                      | 5-p   | Sedan            | 820     |  |
| 2150                                      | 5-p   | Spec. Sedan      | 1,090   |  |
| STEARNS-KNIGHT                            |       |                  |         |  |
| "B" (4)                                   |       |                  |         |  |
| 3775                                      | 4-p   | Coupe Roadster   | \$1,795 |  |
| 3775                                      | 5-p   | Touring          | 1,595   |  |
| 4250                                      | 5-p   | Sedan            | 2,095   |  |
| 3750                                      | 4-p   | Coupe Brougham   | 1,895   |  |
| 3750                                      | 5-p   | Brougham         | 2,095   |  |
| "B" (6)                                   |       |                  |         |  |
| 3775                                      | 2-p   | Roadster         | 2,495   |  |
| 3775                                      | 5-p   | Touring          | 2,395   |  |
| 3850                                      | 7-p   | Touring          | 2,495   |  |
| 4025                                      | 2-p   | Coupe            | 3,395   |  |
| 4275                                      | 4-p   | Sp. Coupe        | 3,150   |  |
| 4275                                      | 5-p   | Sedan            | 2,945   |  |
| 4275                                      | 7-p   | Sp. Sedan        | 3,395   |  |
| "C" (6)                                   |       |                  |         |  |
| 3775                                      | 4-p   | Touring          | 1,875   |  |
| 3775                                      | 5-p   | Touring          | 1,875   |  |
| 3775                                      | 2-p   | Sport Coupe      | 2,185   |  |
| 3775                                      | 5-p   | Coupe Brougham   | 2,285   |  |
| 3775                                      | 5-p   | Sedan            | 2,475   |  |
| 3775                                      | 5-p   | Brougham         | 2,475   |  |
| STERLING-KNIGHT                           |       |                  |         |  |
| 3200                                      | 4-p   | Sp. Touring      | \$2,250 |  |
| 3235                                      | 5-p   | Phaeton          | 2,150   |  |
| 3300                                      | 7-p   | Touring          | 2,400   |  |
| 3200                                      | 2-p   | Coupe Roadster   | 3,100   |  |
| 3450                                      | 5-p   | Sedan            | 2,800   |  |
| 3550                                      | 7-p   | Sedan            | 3,050   |  |
| 3450                                      | 4-p   | Sp. Brougham     | 2,750   |  |
| 3300                                      | 4-p   | Coupe            | 3,200   |  |
| STEVENS-DURYEA                            |       |                  |         |  |
| 4200                                      | 2-p   | Roadster         | \$8,150 |  |
| 4400                                      | 7-p   | Touring          | 7,500   |  |
| 4250                                      | 4-p   | Sp. Touring      | 7,750   |  |
| 4600                                      | 4-p   | Coupe            | 9,000   |  |
| 4800                                      | 4-p   | Sedan            | 10,000  |  |
| 4800                                      | 6-p   | Sedan            | 9,675   |  |
| 4800                                      | 6-p   | Town Brougham    | 10,175  |  |
| 4800                                      | 6-p   | Vestibule Limou. | 9,675   |  |
| 4800                                      | 7-p   | Vestibule Limou. | 10,175  |  |
| 4800                                      | 7-p   | 1/2 Limousine    | 10,175  |  |
| 4800                                      | 7-p   | Cabriolet        | 10,175  |  |
| STUDEBAKER                                |       |                  |         |  |
| Standard Six                              |       |                  |         |  |
| 2510                                      | 3-p   | Du. Roadster     | \$1,125 |  |
| 2870                                      | 5-p   | Du. Phaeton      | 1,145   |  |
| 3110                                      | 4-p   | Coupe Roadster   | 1,395   |  |
| 3260                                      | 5-p   | Coupe            | 1,495   |  |
| 3260                                      | 5-p   | Sedan            | 1,595   |  |
| 3260                                      | 5-p   | Berline          | 1,650   |  |

| Ship.                                     |       |                |         |  |
|---|-------|----------------|---------|--|
| Wt.                                       | Pass. | Body Style     | Price   |  |
| Special Six                               |       |                |         |  |
| 3065                                      | 3-p   | Du. Roadster   | \$1,450 |  |
| 3475                                      | 5-p   | Du. Phaeton    | 1,495   |  |
| 3675                                      | 4-p   | Victoria       | 2,050   |  |
| 3855                                      | 5-p   | Sedan          | 2,250   |  |
| 3855                                      | 5-p   | Berline        | 2,225   |  |
| Big Six                                   |       |                |         |  |
| 3785                                      | 7-p   | Du. Phaeton    | 1,875   |  |
| 4030                                      | 5-p   | Coupe          | 2,650   |  |
| 4150                                      | 7-p   | Sedan          | 2,785   |  |
| 4200                                      | 7-p   | Berline        | 2,860   |  |
| STUTZ                                     |       |                |         |  |
| "693-4"                                   |       |                |         |  |
| 3250                                      | 3-p   | Roadster       | ††----- |  |
| 3350                                      | 5-p   | Touring        | ††----- |  |
| 3750                                      | 5-p   | Sedan          | ††----- |  |
| "695"                                     |       |                |         |  |
| 3900                                      | 5-p   | Sportster      | ††----- |  |
| 3950                                      | 7-p   | Touring        | ††----- |  |
| 4150                                      | 5-p   | Sedan          | ††----- |  |
| 4350                                      | 7-p   | Sedan          | ††----- |  |
| 4450                                      | 7-p   | Berline        | ††----- |  |
| ††Manufacturers do not quote list prices. |       |                |         |  |
| TEMPLAR                                   |       |                |         |  |
| 3300                                      | 4-p   | Suburban Tour. | \$2,175 |  |
| 3300                                      | 5-p   | Phaeton        | 1,985   |  |
| 3300                                      | 5-p   | Sedan          | 2,785   |  |
| 3300                                      | 4-p   | Brougham       | 2,650   |  |

# Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

| MAKE AND MODEL            | Wheelbase (Ins.) | TIRES                |      | Balloon Equipment | ENGINE |              |   |                            |                   |                 |                                    |               |                 |                      | Electrical System          |               | Clutch | Gear-set      | Universal Joints | REAR AXLE  |                         | BRAKES                  |                        |          | Steering Gear   | Rear Springs |
|---------------------------|------------------|----------------------|------|-------------------|--------|--------------|---|----------------------------|-------------------|-----------------|------------------------------------|---------------|-----------------|----------------------|----------------------------|---------------|--------|---------------|------------------|------------|-------------------------|-------------------------|------------------------|----------|-----------------|--------------|
|                           |                  | Standard Size (Ins.) | Type |                   | Make   | Model        | Number of Cylinders, Bore and Stroke (Ins.) | Rated Horsepower, N.A.C.C. | Valve Arrangement | Piston Material | Number of Main Crankshaft Bearings | Oiling System | Carburetor Make | Ignition System Make | Generator and Starter Make | Type and Make | Make   | Type and Make | Type and Make    | Gear Ratio | Foot, Type and Location | Hand, Type and Location | Four-Wheel Brake, Type | Make     | Type and Length |              |
|                           |                  |                      |      |                   |        |              |   |                            |                   |                 |                                    |               |                 |                      |                            |               |        |               |                  |            |                         |                         |                        |          |                 |              |
| Ambassador.....D-1        | 114              | 31x4                 | Yes  | Cont              | 7U     | 6-31/2x4 1/2 | 23.44                                       | L                          | C                 | 3               | Sp                                 | Zen           | Del             | Del                  | D-Lon                      | Opt           | Spi    | 1 1/2 Tim     | 4.90             | E-R        | E-T                     | None                    | Ros                    | S-56     |                 |              |
| American.....D-66         | 127              | 33x4 1/2             | No   | H-Sp              | 91     | 6-31/2x5     | 29.40                                       | L                          | C                 | 4               | PC                                 | Str           | Del             | Del                  | P-B&B                      | War           | M-Har  | 1 1/2 Sal     | 5.10             | E-R        | E-T                     | None                    | Lav                    | S-57 1/2 |                 |              |
| Anderson.....41           | 115              | 31x5.2               | Yes  | Cont              | 7U     | 6-31/2x4 1/2 | 23.44                                       | L                          | C                 | 4               | PC                                 | Str           | Wes             | Wes                  | P-B&B                      | Dur           | F-Thi  | 1 1/2 Sal     | 4.75             | E-R        | E-T                     | Mec*                    | Gem                    | S-58     |                 |              |
| Anderson.....50           | 122              | 33x4.9               | Yes  | Cont              | 8R     | 6-31/2x4 1/2 | 27.34                                       | L                          | C                 | 4               | PC                                 | Zen           | Rem             | Rem                  | P-B&B                      | Dur           | F-Thi  | 1 1/2 Sal     | 4.50             | E-R        | E-T                     | Mec*                    | Gem                    | S-58     |                 |              |
| Apperson.....6            | 120              | 32x5.7               | Yes  | Own               | 6      | 6-31/2x4 1/2 | 24.40                                       | L                          | C                 | 4               | FP                                 | Str           | Rem             | Rem                  | P-Roc                      | Mec           | M-Tri  | 1 1/2 Col     | 5.10             | E-R        | E-T                     | Mec*                    | Lav                    | J-48     |                 |              |
| Apperson.....8            | 130              | 32x6.7               | Yes  | Own               | 8      | 8-31/2x5     | 33.80                                       | L                          | C                 | 3               | PC                                 | Sch           | Rem             | Rem                  | D-Own                      | Own           | M-Thi  | 1 1/2 Own     | 5.10             | E-R        | E-T                     | Mec*                    | Own                    | J-48     |                 |              |
| Auburn.....6-43           | 111              | 31x4                 | Yes* | Cont              | 7U     | 6-31/2x4 1/2 | 23.44                                       | L                          | C                 | 4               | PC                                 | Str           | Rem             | Rem                  | P-B&B                      | W-G           | M-Thi  | 1 1/2 Col     | 4.63             | E-R        | E-T                     | Mec*                    | Jac                    | S-57     |                 |              |
| Auburn.....8-63           | 124              | 32x6.2               | Yes  | Lyc               | H      | 8-31/2x4 1/2 | 31.25                                       | L                          | C                 | 5               | PC                                 | Str           | Del             | Del                  | P-B&B                      | W-G           | M-Thi  | 1 1/2 Col     | 4.63             | E-R        | E-T                     | Mec*                    | Jac                    | S-57     |                 |              |
| Barley.....6-50           | 118              | 32x4                 | No   | Cont              | 7U     | 6-31/2x4 1/2 | 23.44                                       | L                          | C                 | 4               | PC                                 | Str           | Del             | Del                  | P-B&B                      | Full          | R-M&E  | 1 1/2 Col     | 5.11             | E-R        | I-R                     | None                    | Jac                    | S-56     |                 |              |
| Buick....."Standard"      | 111 1/2          | 31x4.7               | Yes  | Own               | Sta    | 6-31/2x4 1/2 | 21.60                                       | L                          | C                 | 4               | PC                                 | Mar           | Del             | Del                  | D-Own                      | Own           | M-Own  | 1 1/2 Own     | 4.90             | E-F        | I-R                     | Mec                     | Jac                    | V-48     |                 |              |
| Buick....."Master"        | 120              | 32x5.7               | Yes  | Own               | 6      | 6-31/2x4 1/2 | 27.31                                       | L                          | C                 | 4               | PC                                 | Mar           | Del             | Del                  | D-Own                      | Own           | M-Own  | 1 1/2 Own     | 4.73             | E-F        | I-R                     | Mec                     | Jac                    | V-47 1/2 |                 |              |
| Cadillac.....V-63         | 132              | 33x5                 | Yes* | Own               | 63     | 8-31/2x5 1/2 | 31.25                                       | L                          | C                 | 3               | PC                                 | Own           | Del             | Del                  | D-Own                      | Own           | M-Spi  | 1 1/2 Own     | 4.50             | B-F        | I-R                     | Mec                     | Own                    | N-54     |                 |              |
| Case.....X                | 122              | 32x4 1/2             | Yes* | Cont              | 8R     | 6-31/2x4 1/2 | 27.34                                       | L                          | C                 | 4               | PC                                 | Ray           | Del             | Del                  | D-Own                      | Own           | R-Sne  | 1 1/2 Col     | 4.90             | E-R        | I-R                     | Hyd*                    | Jac                    | S-54 1/2 |                 |              |
| Case.....JIC              | 122              | 32x4 1/2             | Yes* | Cont              | 8R     | 6-31/2x4 1/2 | 27.31                                       | L                          | C                 | 4               | PC                                 | Sch           | Del             | Del                  | D-Own                      | Own           | R-Sne  | 1 1/2 Col     | 4.90             | E-R        | I-R                     | Hyd*                    | Lav                    | S-55     |                 |              |
| Case.....Y                | 122              | 33x5                 | Yes* | Cont              | 6T     | 6-31/2x5     | 33.75                                       | L                          | C                 | 4               | PC                                 | Sch           | Del             | Del                  | D-Own                      | Own           | R-Sne  | 1 1/2 Col     | 4.45             | E-R        | I-R                     | Hyd                     | Own                    | S-57     |                 |              |
| Chandler.....SS           | 123              | 33x6.0               | Yes  | Own               | 6      | 6-31/2x5     | 29.40                                       | L                          | C                 | 4               | PC                                 | Sch           | Bos             | Bos                  | P-B&B                      | Own           | R-Own  | 1 1/2 Own     | 4.45             | E-F        | E-T                     | Mec                     | Own                    | Q-28     |                 |              |
| Chevrolet.....Superior    | 103              | 30x3 1/2             | No   | Own               | Sup    | 1-31/2x4     | 21.76                                       | I                          | C                 | 3               | PS                                 | Zen           | Rem             | Rem                  | K-Own                      | Own           | M-Own  | 1 1/2 Own     | 3.77             | E-R        | E-T                     | None                    | Own                    | S-58 1/2 |                 |              |
| Chrysler.....Six          | 112 1/2          | 30x5.7               | Yes  | Own               | Six    | 6-31/2x4 1/2 | 21.60                                       | L                          | A                 | 7               | FP                                 | Bal           | Rem             | Rem                  | D-Own                      | Own           | M-Own  | 1 1/2 Own     | 4.60             | E-F        | E-T                     | Hyd                     | Jac                    | S-53     |                 |              |
| Cleveland.....43          | 115 1/2          | 31x5.2               | Yes  | Own               | 43     | 6-31/2x4 1/2 | 23.44                                       | L                          | C                 | 3               | PC                                 | Sch           | Bos             | Bos                  | P-B&B                      | Own           | R-Sne  | 1 1/2 Own     | 4.90             | E-R        | E-T                     | Mec*                    | CAS                    | S-53     |                 |              |
| Cole.....Master           | 127              | 31x7.3               | Yes  | Nort              | 311    | 8-31/2x5 1/2 | 39.20                                       | L                          | A                 | 3               | PC                                 | Sch           | Del             | Del                  | D-Nor                      | Own           | M-Spi  | 1 1/2 Col     | 4.10             | E-R        | I-R                     | None                    | Own                    | S-57     |                 |              |
| Crawford.....6-70         | 138              | 33x4 1/2             | No   | Cont              | 6T     | 6-31/2x5 1/2 | 31.51                                       | L                          | C                 | 4               | PC                                 | Zen           | Wes             | Bos                  | D-B-L                      | B-L           | M-Spi  | 1 1/2 Tim     | 5.00             | E-R        | I-R                     | None                    | Lav                    | S-       |                 |              |
| Cunningham.....V4         | 142              | 33x5                 | Yes* | Own               | V4     | 8-31/2x5     | 45.00                                       | L                          | C                 | 3               | FP                                 | Str           | Del             | Del                  | D-Own                      | Own           | R-Sne  | 1 1/2 Tim     | 4.23             | E-R        | I-R                     | None                    | Own                    | J-62     |                 |              |
| Dagmar.....6-70           | 138              | 33x5                 | No   | Cont              | 6T     | 6-31/2x5 1/2 | 31.51                                       | L                          | C                 | 4               | PC                                 | Zen           | Wes             | Bos                  | D-B-L                      | B-L           | M-Spi  | 1 1/2 Tim     | 5.00             | E-R        | I-R                     | None                    | Lav                    | S-       |                 |              |
| Daniels.....24-38         | 133              | 33x5                 | Yes* | Own               | 24-38  | 8-31/2x5 1/2 | 39.20                                       | L                          | C                 | 3               | PC                                 | Zen           | Del             | Del                  | P-Own                      | Own           | M-Spi  | 1 1/2 Tim     | 4.23             | E-R        | I-R                     | None                    | Ros                    | S-       |                 |              |
| Davis.....90              | 115              | 31x4                 | Yes* | Cont              | 7U     | 6-31/2x4 1/2 | 23.44                                       | L                          | C                 | 5               | PC                                 | Str           | Del             | Del                  | P-B&B                      | W-G           | M-Pet  | 1 1/2 Tim     | 5.10             | E-F        | I-R                     | Hyd                     | Ros                    | S-52     |                 |              |
| Davis.....91              | 113              | 32x4 1/2             | Yes* | Cont              | 8R     | 6-31/2x4 1/2 | 27.31                                       | L                          | C                 | 4               | PC                                 | Str           | Del             | Del                  | P-B&B                      | W-G           | M-Pet  | 1 1/2 Tim     | 5.10             | E-F        | I-R                     | Hyd                     | Ros                    | S-52     |                 |              |
| Dodge Brothers.....       | 116              | 30x5.7               | Yes  | Own               | 4      | 1-37/8x4 1/2 | 21.03                                       | L                          | A                 | 3               | PS                                 | Ste           | N.E.            | N.E.                 | D-Own                      | Own           | M-Own  | 1 1/2 Own     | 4.51             | E-R        | I-R                     | None                    | Own                    | S-55     |                 |              |
| Dorris.....               | 132              | 32x6.2               | Yes  | Own               | 6-80   | 6-4x5        | 38.40                                       | I                          | A                 | 3               | PC                                 | Str           | Bos             | Bos                  | D-Own                      | Own           | B-L    | 1 1/2 Tim     | 3.77             | E-R        | I-R                     | None                    | Ros                    | S-60     |                 |              |
| Duesenberg Straight.....8 | 131              | 33x5                 | Yes  | Own               | 8      | 8-27/8x5     | 25.45                                       | I                          | A                 | 3               | PC                                 | Str           | Del             | Del                  | P-Own                      | Own           | R-Cl   | 1 1/2 Own     | 4.90             | E-F        | E-T                     | Hyd                     | Ros                    | S-59     |                 |              |
| Dupont.....D              | 121              | 32x6.2               | Yes  | Wis               | Y      | 6-31/2x5     | 27.34                                       | I                          | C                 | 3               | FP                                 | Sch           | Bos             | Bos                  | D-Lon                      | Cpl           | M-Uni  | 1 1/2 Eat     | 4.45             | E-R        | I-R                     | None                    | Jac                    | S-59     |                 |              |
| Durant.....A-22           | 109              | 31x4                 | Yes* | Cont              | Spec   | 4-37/8x4 1/2 | 24.03                                       | I                          | A                 | 3               | PC                                 | Til           | A-L             | A-L                  | P-Own                      | War           | M-Spi  | 1 1/2 Ad      | 4.33             | E-R        | I-R                     | Mec*                    | War                    | S-50 1/2 |                 |              |
| Elcar.....4-41            | 112              | 31x4                 | Yes* | Lyc               | CF     | 1-31/2x5     | 21.03                                       | L                          | A                 | 5               | PC                                 | Zen           | A-L             | A-L                  | P-B&B                      | W-G           | M-Mec  | 1 1/2 Sal     | 4.70             | E-R        | E-T                     | Mec*                    | Ros                    | S-51     |                 |              |
| Elcar.....6-51            | 112              | 31x4                 | Yes* | Cont              | 7U     | 6-31/2x4 1/2 | 23.44                                       | L                          | C                 | 4               | PC                                 | Zen           | A-L             | A-L                  | P-B&B                      | W-G           | M-Mec  | 1 1/2 Sal     | 4.70             | E-R        | E-T                     | Mec*                    | Ros                    | E-51     |                 |              |
| Elcar.....6-61            | 118              | 32x4                 | Yes* | Cont              | 8R     | 6-31/2x4 1/2 | 27.34                                       | L                          | C                 | 4               | PC                                 | Str           | Del             | Del                  | P-B&B                      | W-G           | M-Har  | 1 1/2 Sal     | 4.70             | E-R        | E-T                     | Mec*                    | Ros                    | S-52     |                 |              |
| Elcar.....8-80            | 127              | 32x6.2               | Yes  | Lyc               | H      | 6-31/2x4 1/2 | 31.25                                       | L                          | C                 | 5               | PS                                 | Ste           | Del             | Del                  | P-B&B                      | W-G           | M-Spi  | 1 1/2 Sal     | 4.71             | E-F        | E-T                     | Hyd                     | Ros                    | S-58     |                 |              |
| Essex.....6               | 110 1/2          | 31x5.2               | Yes  | Own               | 6      | 6-21/2x4 1/2 | 17.32                                       | L                          | A                 | 3               | Sp                                 | Ste           | Bos             | Bos                  | D-Own                      | Own           | M-Spi  | 1 1/2 Own     | 5.60             | E-R        | I-R                     | None                    | Own                    | S-54 1/2 |                 |              |
| Flint.....40              | 115              | 30x5.2               | Yes  | Cont              | 40     | 6-31/2x4 1/2 | 23.44                                       | L                          | C                 | 4               | PC                                 | Til           | A-L             | A-L                  | P-Own                      | War           | M-Spi  | 1 1/2 Ad      | 4.77             | E-F        | E-F                     | Mec                     | War                    | S-50     |                 |              |
| Flint.....55              | 120              | 32x4 1/2             | Yes* | Cont              | 55     | 6-31/2x5     | 27.31                                       | L                          | C                 | 7               | PC                                 | Str           | Del             | Del                  | P-Own                      | War           | M-Spi  | 1 1/2 Ad      | 4.77             | E-R        | I-R                     | Hyd*                    | War                    | S-54     |                 |              |
| Ford.....T                | 100              | 30x3 1/2             | No   | Own               | T      | 4-31/2x4     | 22.50                                       | L                          | C                 | 3               | Sp                                 | (Own Kin)     | Own             | Own                  | D-Own                      | Own           | M-Own  | 1 1/2 Own     | 3.63             | E-T        | I-R                     | None                    | Own                    | O-43 1/2 |                 |              |
| Franklin.....10 C         | 115              | 32x4.9               | Yes  | Own               | 10-C   | 6-31/2x4     | 25.35                                       | I                          | A                 | 7               | PC                                 | Str           | A-K             | A-K                  | P-M&E                      | Own           | M-Spi  | 1 1/2 Own     | 4.73             | E-T        | E-R                     | None                    | Own                    | E-38     |                 |              |
| Gardner.....Series 5      | 112              | 32x4                 | Yes* | Lyc               | CE     | 4-31/2x5     | 21.76                                       | L                          | A                 | 5               | PC                                 | Zen           | Wes             | Wes                  | P-B&B                      | Mec           | M-Pet  | 1 1/2 Fli     | 4.80             | I-R        | I-R                     | None                    | Ros                    | S-51     |                 |              |
| Gray.....O                | 104              | 30x3 1/2             | Yes* | Own               | R      | 4-31/2x4     | 21.03                                       | L                          | C                 | 3               | Sp                                 | Sec           | Wes             | Wes                  | P-Own                      | Det           | R-Sne  | 1 1/2 Tim     | 3.90             | I-R        | I-R                     | None                    | Own                    | Q-30     |                 |              |
| H.C.S.....Series 6        | 123              | 32x5                 | Yes* | Own               | 6      | 6-31/2x5     | 29.40                                       | I                          | C                 | 3               | FP                                 | Str           | Del             | Del                  | D-B-L                      | B-L           | M-Spi  | 1 1/2 Own     | 4.63             | I-R        | I-R                     | None                    | Gem                    | S-56     |                 |              |
| Hatfield.....6-55         | 121              | 32x4                 | No   | H-Sp              | 40     | 6-31/2x5     | 25.35                                       | L                          | C                 | 3               | PS                                 | Str           | Bos             | Bos                  | P-B&B                      | Dur           | M-Spi  | 1 1/2 Col     | 4.63             | E-R        | I-R                     | None                    | Own                    | S-58     |                 |              |
| Haynes.....0              | 121              | 33x5.7               | Yes  | Own               | 60     | 6-31/2x4 1/2 | 29.40                                       | L                          | C                 | 3               | PS                                 | Ray           | Bin             | L-N                  | D-Own                      | Mec           | M-Thi  | 1 1/2 Own     | 4.41             | E-R        | E-T                     | None                    | Jac                    | S-54 1/2 |                 |              |
| Hudson.....Super 6        | 127              | 32x6.2               | Yes  | Own               | 6      | 6-31/2x5     | 29.40                                       | L                          | A                 | 4               | PC                                 | Ste           | Bos             | Bos                  | D-Own                      | Own           | M-Thi  | 1 1/2 Own     | 4.45             | E-R        | I-R                     | None                    | Gem                    | S-58     |                 |              |
| Hupmobile.....Series R    | 115              | 31x5.2               | Yes  | Own               | R      | 4-31/2x5 1/2 | 16.90                                       | L                          | C                 | 3               | PC                                 | Str           | Wes             | Wes                  | D-Lon                      | Own           | M-Uni  | 1 1/2 Own     | 4.87             | E-R        | I-R                     | None                    | Ros                    | S-56 1/2 |                 |              |
| Jewett.....SR             | 112              | 32x4.9               | Yes  | Own               | 6      | 6-31/2x5     | 25.36                                       | L                          | C                 | 3               | PC                                 | Ray           | A-K             | Rem                  | D-Lon                      | W-G           | M-Mec  | 1 1/2 Tim     | 4.45             | E-R        | E-T                     | None                    | Gem                    | S-54     |                 |              |
| Jordan.....K&L            | 120              | 32x4                 | Yes* | Cont              | Spec   | 6-31/2x4 1/2 | 26.34                                       | L                          | C                 | 4               | PC                                 | Str           | Del             | Del                  | P-Det                      | Det           | M-Thi  | 1 1/2 Tim     | 4.45             | E-F        | E-T                     | Hyd                     | Gem                    | S-55 1/2 |                 |              |
| Jordan....."A"            | 125 1/2          | 32x6.2               | Yes  | Cont              | Spec   | 8-31/2x4 1/2 | 28.60                                       | L                          | C                 | 5               | PC                                 | Str           |                 |                      |                            |               |        |               |                  |            |                         |                         |                        |          |                 |              |





Miniature reproduction of color advertisement appearing in the December 13th issue of The Saturday Evening Post.

## Christmas Candlelight

GOLDEN GLEAMS ACROSS THE SNOW . . . Laughing voices in the dusk . . . Princesses and Knights in package-filled motor cars, slowly weaving in and out through the colorful shopping crowds.

Your car! A vibrant blue against the merry reds of Holly and Poinsettia—in its lustrous DUCO finish, whose soft velvety glow becomes more beautiful with the passing of time.

The bleakness of the Winter's fiercest storms will not injure its surface—and the Summer's broiling sun will not crack nor mar its satin glory.

Next Christmas its slumbrous color will still thrill you!

E. I. DU PONT DE NEMOURS & CO., INC.  
Chemical Products Division  
PARLIN, N. J. FLINT, MICH.  
Canadian Distributors: Flint Varnish & Color Works, Toronto



### Other Uses

Genuine DUCO is ideal for almost any product requiring a long-lasting finish. It is used on work-drying machines, on storage cases and instruments in finished product. DUCO is also used on many household items. It is a long-lasting and very durable finish.



Look for the DUCO Stamp

## Holiday Greetings!

FROM every motor salesroom — and the busy thoroughfares outside, DUCO finished cars glow in the lights of Christmastide.

New cars and refinished cars — cars of every make and price class—show that in the past year Genuine DUCO has more than proved itself in the eyes of manufacturer and public alike.

Next year these same cars will go about their Yuletide business, as richly beautiful as they are today!

E. I. DU PONT DE NEMOURS & CO., Inc.

Chemical Products Division:

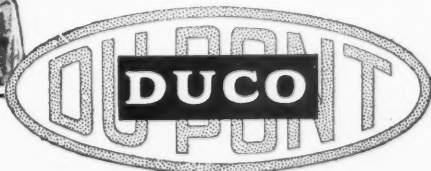
Parlin, N. J.

Flint, Mich.

Canadian Distributors: Flint Varnish & Color Works, Toronto

Duco is factory standard on: Hupmobile (all models); Jewett (all models except Standard Brougham); Marmon (all models); Maxwell (all models); Moon (all models); Oakland (all models); Oldsmobile (all models); Buick (all Sport Models); Cadillac (Roadster); Chevrolet (all de Luxe Models); Gardner (Special Touring Models); Meteor Motor Car Co. (Standard); Nash (Special Six Touring, Special Six Sedan, Advanced Six Sedan)

Over 600 Duco Refinishing Stations have already been established throughout the country. Training schools are being organized as rapidly as possible.



## Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

| MAKE AND MODEL           | Wheelbase (Ins.) | TIRES                |                   | ENGINE |       |   |                            |                   |                 |                                    |               |                 |                      | Electrical System | Clutch | Gear-set | Universal Joints | REAR AXLE                  |               | BRAKES    |               |               |            | Steering Gear | Rear Springs |                         |
|--------------------------|------------------|----------------------|-------------------|--------|-------|---|----------------------------|-------------------|-----------------|------------------------------------|---------------|-----------------|----------------------|-------------------|--------|----------|------------------|----------------------------|---------------|-----------|---------------|---------------|------------|---------------|--------------|-------------------------|
|                          |                  | Standard Size (Ins.) | Balloon Equipment | Make   | Model | Number of Cylinders, Bore and Stroke (Ins.) | Rated Horsepower, N.A.C.C. | Valve Arrangement | Piston Material | Number of Main Crankshaft Bearings | Oiling System | Carburetor Make | Ignition System Make |                   |        |          |                  | Generator and Starter Make | Type and Make | Make      | Type and Make | Type and Make | Gear Ratio |               |              | Foot, Type and Location |
| Paige.....               | 131              | 33x4 1/2             | Yes*              | Cont   | Spec  | 6-3 1/2 x 5                                 | 33.75                      | L                 | C               | 4                                  | PC            | Ray             | A-K                  | Rem               | D-Lon  | W-G      | M-Mec            | 1 1/2 Tim                  | 4.90          | E-R       | I-R           | None          | Gem        | ~61 3/4       |              |                         |
| Peerless.....            | 70               | 33x6.2               | Yes               | Own    | 70    | 6-3 1/2 x 5                                 | 29.40                      | L                 | C               | 7                                  | PC            | Joh             | Del                  | Del               | D-Own  | Own      | M-Spi            | 1 1/2 Tim                  | 4.66          | E-F       | I-R           | Hyd           | Gem        | S-54          |              |                         |
| Peerless Equipped "8"    | 128              | 33x6.6               | Yes               | Own    | 66    | 8-3 1/2 x 5                                 | 33.80                      | L                 | C               | 3                                  | PC            | Str             | Del                  | Del               | D-Own  | Own      | M-Spi            | 1 1/2 Tim                  | 4.90          | E-R       | I-R           | Hyd           | Gem        | S-60          |              |                         |
| Pierce-Arrow.....        | 33               | 33x5                 | No                | Own    | 33    | 6-4 x 5 1/2                                 | 38.40                      | T                 | C               | 7                                  | FP            | Own             | Del                  | Del               | D-Own  | Own      | R-Goo            | 1 1/2 Tim                  | 4.29          | E-R       | I-R           | Mec*          | Gem        | S-60          |              |                         |
| Pierce-Arrow..... "80"   | 130              | 32x5.7               | Yes               | Own    | "80"  | 6-3 1/2 x 5                                 | 29.40                      | L                 | C               | 7                                  | PC            | Own             | Del                  | Del               | P-B&B  | B-L      | M-Spi            | 1 1/2 Tim                  | 4.45          | I-F       | I-R           | Mec           | Gem        | S-56 1/2      |              |                         |
| Reo.....                 | T6               | 32x6.2               | Yes               | Own    | T6    | 6-3 3/8 x 5                                 | 24.34                      | G                 | A               | 4                                  | PS            | Sch             | NE                   | NE                | D-Own  | Own      | M-Own            | 1 1/2 Own                  | 4.70          | E-R       | I-R           | None          | Own        | S-54 1/2      |              |                         |
| Revere.....              | 25               | 32x6.2               | Yes               | Cont   | 6-1   | 6-3 3/4 x 5                                 | 33.75                      | H                 | C               | 4                                  | PC            | Sch             | Bos                  | Wes               | D-Ful  | Ful      | M-Spi            | 3/4 Col                    | 3.75          | I-F       | E-T           | Mec           | Gem        | S-56 1/2      |              |                         |
| Rickenbacker.....        | C                | 127                  | 32x4              | Yes*   | Own   | C   | 6-3 1/2 x 4 1/2            | 23.44             | L               | C                                  | 3             | PC              | Str                  | Bos               | D-Own  | W-G      | M-Mec            | 1 1/2 Own                  | 4.63          | I-F       | E-T           | Mec           | Gem        | S-57          |              |                         |
| Rickenbacker.....        | A                | 121 1/2              | 33x4 1/2          | Yes*   | Own   | A   | 8-3 x 4 1/2                | 28.60             | L               | C                                  | 9             | PC              | Zen                  | Bos               | D-Own  | W-G      | M-Mec            | 1 1/2 Own                  | 5.10          | I-F       | E-T           | Mec           | Gem        | S-59          |              |                         |
| Roamer.....              | 6-54-E           | 118                  | 32x4 1/2          | No     | Cont  | 12XD  | 6-3 1/2 x 5 1/4            | 29.40             | L               | A                                  | 3             | PS              | Str                  | Spl               | Wes    | P-B&B    | Ful              | R-M&E                      | 3/4 Tim       | 4.60      | E-R           | I-R           | Mec*       | Jac           | V-55 1/2     |                         |
| Roamer.....              | 4-75-E           | 123                  | 32x4 1/2          | No     | Dues  | G1  | 4-4 1/2 x 6                | 28.90             | H               | A                                  | 3             | FP              | Str                  | Bos               | Wes    | D-B-L    | B-L              | R-M&E                      | 3/4 Tim       | 4.63      | E-R           | I-R           | Mec*       | Jac           | V-55 1/2     |                         |
| Rollin.....              | G                | 112                  | 31x5.2            | Yes    | Own   | G   | 4-3 1/2 x 4 1/2            | 16.90             | L               | A                                  | 4             | PC              | TH                   | Con               | Dyn    | P-B&B    | Mun              | R-Sne                      | 1 1/2 Sal     | 5.10      | E-F           | E-F           | Mec        | Ros           | O-46         |                         |
| Rolls-Royce.....         | 43-50            | 143 1/2              | 33x5              | No     | Own   | 40  | 6-4 1/2 x 4 3/4            | 48.60             | L               | A                                  | 7             | FP              | Own                  | Bos               | "O"    | K-Own    | Own              | M-Own                      | F Own         | 3.72      | I-R           | I-R           | None       | Own           | V-54 1/2     |                         |
| Stanley.....             | 252              | 122                  | 31x4.9            | Yes    | Own   | 252   | 2-4 x 5                    | 13.00             | X               | C                                  | 2             | Sp              | Non                  | Non               | Bos    | Non      | R-The            | 1 1/2 Own                  | 4.50          | E-F       | I-R           | Mec           | Ros        | S-58          |              |                         |
| Star.....                | A                | 102                  | 30x3 1/2          | Yes*   | Cont  | Spec  | 1-3 3/4 x 4 1/4            | 18.23             | L               | A                                  | 3             | PS              | Til                  | A-L               | P-Own  | War      | M-Spi            | 3/4 Ad                     | 4.87          | E-R       | I-R           | Mec*          | War        | S-49 1/2      |              |                         |
| Stearns Knight.....      | C                | 121                  | 32x4 1/2          | Yes*   | Own   | Kui   | 6-3 1/2 x 5                | 25.35             | X               | C                                  | 4             | PC              | Joh                  | DeJ               | D-M&E  | Own      | R-Cli            | 1 1/2 Own                  | 5.30          | E-R       | I-R           | Hyd*          | Eat        | V-50          |              |                         |
| Stearns Knight.....      | B                | 119                  | 33x4 1/2          | Yes*   | Own   | Kui   | 1-3 3/4 x 5 5/8            | 22.50             | X               | C                                  | 3             | PC              | Sch                  | A-K               | A-L    | D-Own    | Own              | R-Cli                      | 1 1/2 Own     | 4.50      | E-R           | I-R           | Hyd*       | Own           | V-50         |                         |
| Stearns Knight.....      | S                | 130                  | 33x6.0            | Yes    | Own   | Kui   | 6-3 1/2 x 5                | 29.40             | X               | C                                  | 4             | PC              | Joh                  | DeJ               | D-M&E  | Own      | R-Cli            | 1 1/2 Own                  | 4.90          | E-R       | I-R           | Hyd           | Sta        | V-50          |              |                         |
| Sterling-Knight.....     | 125              | 32x4 1/2             | Yes*              | Own    | Kui   | 6-3 1/2 x 4 5/8                             | 25.35                      | X                 | C               | 7                                  | FP            | Str             | Wes                  | Bos               | D-Ful  | Ful      | R-Cli            | 1 1/2 Tim                  | 4.66          | E-R       | I-R           | Mec*          | Ros        | S-58          |              |                         |
| Stevens-Duryea.....      | G                | 133                  | 33x5              | No     | Own   | G   | 6-4 1/2 x 5 1/2            | 47.25             | L               | C                                  | 4             | PS              | Str                  | Bos               | D-B-L  | B-L      | M-Spi            | F Tim                      | 3.76          | E-R       | I-R           | None          | Ros        | S-57 1/2      |              |                         |
| Studebaker.....          | Sta. Six         | 113                  | 31x5.2            | Yes    | Own   | ER  | 6-3 3/4 x 4 1/2            | 27.34             | L               | C                                  | 4             | PC              | Str                  | Wag               | Wag    | P-Own    | Own              | R-The                      | 1 1/2 Own     | 4.18      | E-R           | E-T           | Hyd*       | Own           | S-50 1/2     |                         |
| Studebaker.....          | Spec. Six        | 120                  | 32x6.2            | Yes    | Own   | EQ  | 6-3 1/2 x 5                | 29.40             | L               | C                                  | 4             | PC              | Str                  | Wag               | Wag    | P-Own    | Own              | M-Spi                      | 1 1/2 Own     | 4.36      | E-R           | E-T           | Hyd*       | Own           | S-56         |                         |
| Studebaker.....          | Big Six          | 127                  | 34x7.3            | Yes    | Own   | EP  | 6-3 3/4 x 5                | 36.04             | L               | C                                  | 4             | PC              | Bal                  | Wag               | Wag    | P-Own    | Own              | M-Spi                      | 1 1/2 Own     | 3.69      | E-R           | E-T           | Hyd*       | Own           | S-56         |                         |
| Stutz.....               | 693-4            | 120                  | 32x4 1/2          | Yes*   | Own   | 691   | 6-3 1/2 x 5                | 29.40             | I               | C                                  | 3             | PC              | Str                  | Rem               | Rem    | P-B&B    | W-G              | M-Mec                      | 1 1/2 Tim     | 5.10      | E-R           | I-R           | None       | Gem           | S-61 1/2     |                         |
| Stutz.....               | 695              | 130                  | 32x4 1/2          | Yes*   | Own   | 691   | 6-3 1/2 x 5                | 29.40             | I               | C                                  | 3             | PC              | Str                  | Rem               | Rem    | P-B&B    | W-G              | M-Mec                      | 1 1/2 Tim     | 4.90      | E-R           | I-R           | Hyd*       | Gem           | S-61 1/2     |                         |
| Templar.....             | 122              | 33x4                 | No                | Own    | 50    | 6-3 3/4 x 5                                 | 27.34                      | L                 | C               | 4                                  | PS            | Til             | Dyn                  | Dyn               | P-M&E  | W-G      | R-Sne            | 3/4 Sal                    | 5.10          | I-F       | E-T           | Mec           | Ros        | S-54          |              |                         |
| Velie.....               | 60               | 118                  | 31x5.2            | Yes    | Own   | 50  | 6-3 3/4 x 4 1/4            | 24.38             | I               | C                                  | 4             | FP              | Str                  | Wes               | P-B&B  | Mun      | M-Thi            | 1 1/2 Sal                  | 5.10          | E-F       | E-T           | Hyd           | Ros        | S-55          |              |                         |
| Westcott.....            | 48               | 125                  | 32x4 1/2          | Yes*   | Cont  | 12X   | 6-3 1/2 x 5 1/4            | 29.40             | L               | A                                  | 3             | PS              | Ray                  | Del               | Del    | P-B&B    | B-L              | M-Pet                      | 1 1/2 Tim     | 4.45      | E-R           | I-R           | Mec*       | Gem           | S-59         |                         |
| Westcott.....            | 44               | 120                  | 32x4 1/2          | Yes*   | Cont  | 8R  | 6-3 3/4 x 4 1/2            | 27.34             | L               | C                                  | 4             | PC              | Str                  | Del               | Del    | P-B&B    | W-G              | M-Pet                      | 1 1/2 Col     | 4.90      | E-R           | E-T           | Mec*       | Gem           | S-57 1/2     |                         |
| Westcott.....            | 60               | 118                  | 32x4              | Yes*   | Cont  | 8R  | 6-3 3/4 x 4 1/2            | 27.34             | L               | C                                  | 4             | PC              | Str                  | Del               | Del    | P-M&E    | W-G              | M-Pet                      | 1 1/2 Col     | 4.63      | E-R           | E-T           | Mec*       | Gem           | S-56         |                         |
| Wills Ste. Claire. A&B&G | 121              | 127                  | 32x6.2            | Yes*   | Own   | A68   | 8-3 1/4 x 4                | 33.80             | I               | C                                  | 3             | FP              | Zen                  | Del               | Del    | P-Own    | Own              | M-Spi                      | 1 1/2 Eat     | 4.45      | (E-F)         | (I-R)         | (None)     | Own           | (S-54 1/2)   |                         |
| Willys Knight.....       | 64&6             | 118                  | 33x1.9            | Yes    | Own   | 64  | 4-3 3/4 x 4 1/2            | 21.03             | X               | C                                  | 3             | PS              | Til                  | A-L               | A-L    | D-Own    | Own              | R-Own                      | 3/4 Own       | 4.44      | E-R           | I-R           | None       | Own           | S-55         |                         |
| Willys Knight.....       | 64&6             | 124                  | 33x5.7            | Yes    | Own   | 64  | 4-3 3/4 x 4 1/2            | 21.03             | X               | C                                  | 3             | PS              | Til                  | A-L               | A-L    | D-Own    | Own              | R-Own                      | 3/4 Own       | 4.44      | E-R           | I-R           | None       | Own           | S-55         |                         |
| TAXICABS                 |                  |                      |                   |        |       |   |                            |                   |                 |                                    |               |                 |                      |                   |        |          |                  |                            |               |           |               |               |            |               |              |                         |
| Checker.....             | 117              | 33x4 1/2             | No                | Buda   | WTU   | 4-3 3/4 x 5 1/2                             | 22.50                      | L                 | C               | 3                                  | PC            | Zen             | Sci                  | Wes               | D-Ful  | Ful      | Blo              | 3/4 Col                    | 4.87          | E-R       | I-R           | None          | Jon        | S-57 1/2      |              |                         |
| Driggs.....              | 108 1/2          | 30x3 1/2             | No                | Own    | ..... | 1-2 5/8 x 4 1/2                             | 11.03                      | L                 | C               | .....                              | PS            | Zen             | Bos                  | Bos               | D-Ful  | Ful      | Spi              | 3/4 Own                    | 4.74          | E-R       | I-R           | None          | Own        | S-            |              |                         |
| Elcar.....               | 4                | 112                  | 31x4              | Yes*   | Lycor | CF  | 4-3 3/4 x 5 1/2            | 21.03             | L               | A                                  | 5             | PC              | Zen                  | A-L               | A-L    | P-B&B    | W-G              | M-Mec                      | 1 1/2 Sal     | 4.75      | E-R           | E-T           | Mec*       | Ros           | S-51         |                         |
| Elcar.....               | 6                | 118                  | 32x4              | Yes*   | Cont  | 8R  | 6-3 3/4 x 4 1/2            | 27.31             | L               | C                                  | 4             | PC              | Str                  | Del               | Del    | P-B&B    | W-G              | Spi                        | 3/4 Sal       | 4.75      | E-R           | I-R           | Mec*       | Ros           | S-52         |                         |
| H.C.Sey.....             | 110              | 29x4 1/2             | No                | Wauk   | CH    | 4-3 1/2 x 5                                 | 19.60                      | L                 | A               | 5                                  | PC            | Zen             | Zen                  | Bos               | Bos    | P-B&B    | W-M              | M-Spi                      | 1 1/2 Own     | 5.10      | E-R           | E-T           | None       | Ros           | S-           |                         |
| Kelsey.....              | E                | 112                  | 32x4              | No     | Lycor | CH  | 4-3 1/2 x 5                | 19.60             | L               | A                                  | 5             | PC              | Zen                  | Zen               | Bos    | Bos      | P-B&B            | W-M                        | M-Spi         | 1 1/2 Own | 5.10          | E-R           | E-T        | None          | Lav          | S-55                    |
| Pennant.....             | 115              | 33x4 1/2             | No                | Buda   | WTU   | 1-3 3/4 x 5 1/2                             | 22.50                      | L                 | B               | 3                                  | PC            | Zen             | Bos                  | Wes               | D-Ful  | Ful      | Blo              | 3/4 Col                    | 4.87          | E-R       | I-R           | None          | Jon        | S-57          |              |                         |
| Premier.....             | 4A               | 118                  | 33x4 1/2          | No     | Buda  | WTU   | 1-3 3/4 x 5 1/2            | 22.50             | L               | B                                  | 3             | PC              | Zen                  | Bos               | Bos    | D-Ful    | Ful              | Blo                        | 3/4 Col       | 4.70      | E-R           | I-R           | None       | Jon           | S-57 1/2     |                         |
| Rauch & Lang.....        | T                | 112                  | 32x4              | No     | Buda  | WTU   | 1-3 3/4 x 5 1/2            | 22.50             | L               | C                                  | 3             | Sp              | Zen                  | Bos               | Dyn†   | D-Dtl    | Det              | Spi                        | 1 1/2 Sta     | 5.10      | E-R           | E-T           | None       | Gem           | S-59 1/2     |                         |
| Rauch & Lang**.....      | 102              | 33x4 1/2             | No                | Own    | ..... | Electric                                    | .....                      | .....             | .....           | .....                              | .....         | .....           | .....                | .....             | .....  | None     | Own              | Own                        | 8.60          | .....     | .....         | .....         | None       | None          | S-           |                         |
| Reo.....                 | 113              | 32x4 1/2             | Yes*              | Own    | T-6   | 6-3 1/2 x 5                                 | 24.30                      | G                 | A               | 4                                  | PS            | Sch             | N-E                  | N-E               | D-Own  | Own      | Own              | 1 1/2 Own                  | 4.70          | E-R       | I-R           | None          | None       | Own           | S-54         |                         |
| Traveler.....            | 108 1/2          | 32x4                 | No                | Buda   | WTU   | 4-3 3/4 x 5 1/2                             | 22.50                      | L                 | B               | 3                                  | PC            | Zen             | Zen                  | Eis               | D-Dtl  | W-M      | Spi              | Col                        | .....         | .....     | .....         | None          | Gem        | S-            |              |                         |
| White.....               | 15A              | 119                  | 31x4 1/2          | No     | Own   | CK  | 1-3 3/4 x 5 1/2            | 22.50             | L               | C                                  | .....         | Sp              | Own                  | Opt               | P-Own  | Own      | Own              | 1 1/2 Own                  | 5.36          | E-R       | I-R           | None          | None       | Own           | S-           |                         |
| Willys Knight.....       | A.B.C.           | 118                  | 32x4 1/2          | Yes*   | Own   | 64  | 4-3 3/4 x 4 1/2            | 21.03             | X               | C                                  | 3             | PS              | Til                  | A-L               | A-L    | D-Own    | Own              | Own                        | 3/4 Own       | 5.12      | E-R           | E-T           | None       | Own           | S-55         |                         |
| Yellow.....              | O-4              | 109                  | 32x4 1/2          | No     | Cont  | V7  | 4-3 3/4 x 5                | 22.50             | L               | C                                  | 3             | Sp              | Zen                  | Bos               | N-E†   | D-B-L    | B-L              | Spi                        | 3/4 Tim       | 4.90      | E-R           | E-T           | None       | Gem           | 50           |                         |
| Yellow.....              | A-2              | 109                  | 29x4 1/2          | Yes    | Cont  | V7  | 4-3 3/4 x 5                | 22.50             | L               | C                                  | 3             | Sp              | Zen                  | Bos               | N-E†   | D-B-L    | B-L              | Spi                        | 3/4 Tim       | 4.90      | E-R           | E-T           | None       | Gem           | 50           |                         |

## TAXICABS

## ABBREVIATIONS—

\*—Electric  
†Generator only  
\*—At extra cost  
‡—On Phaeton models  
A—Aluminum  
Anst—Ansted  
Ad—Adams  
A-K—Atwater-Kent  
A-L—Auto-Lite  
B—Semi Steel  
Bal—Ball & Ball  
B & B—Borg & Beck  
B-F—Both Internal and External Four Wheels  
Bij—Bijur  
B-L—Brown-Lipe  
Blo—Blood  
Bos—Bosch  
C—Cast Iron  
Car—Carter  
Cil—Climax  
Col—Columbia  
Con—Connecticut  
Cont—Continental  
Cpl—Campbell

D—Multiple Disc  
Del—Delco  
Det—Detroit  
De J—De Jon  
Dit—Ditwiler  
Doo—Dooley  
Dtl—Detlaiff  
Dues—Duesenberg  
Dur—Durstion  
Dyn—Dyneto  
E—Full Elliptic  
E-F—External Four Wheels  
E-R—External Rear Wheels  
E-T—External Transmission  
Eat—Eaton  
F—Full Floating  
Fall—Falls  
Flt—Flint  
FP—Full Pressure to all bearings including wrist pins  
Ful—Fuller  
1/2 F—Semi-Floating  
3/4 F—Three-Quarter Floating  
G—Head and Side  
G-D—Gray & Davis  
Gem—Gemmer

G-L—Grant-Lees  
Goo—Goodrich  
H—Horizontal  
Har—Hart  
Hol—Holley  
Hoo—Hoosier  
H-Sp—Herschell-Spillman  
Hyd—Hydraulic  
I—In Head  
I-F—Internal Four Wheels  
I-R—Internal Rear Wheels  
J—Three-Quarter Elliptic  
Jac—Jacox  
Jax—Jaxon  
Joh—Johnson  
Jon—Jones  
K—Cone  
Kin—Kingston  
L—L Head  
Lav—Lavine  
Lon—Long  
L-N—Leece-Neville  
Lyc—Lycoming  
Mar—Marvel  
M—Metal  
M & E—Merchant & Evans

Mec—Mechanics  
Mon—Monson  
Mun—Muncie  
N—Platform  
Non—None  
N. E.—North East  
Nor—Northway  
O—Special Type  
Opt—Optional  
P—Single Plate  
PC—Pressure to all Crankshaft and connecting rod bearings  
Pen—Penfield  
Pet—Peters  
Pic—Pick  
PS—Splash and Pressure  
Q—Quarter Elliptic  
R—Fabric  
Ray—Rayfield  
Rem—Remy  
Roc—Rockford  
Ros—Ross  
S—Semi Elliptic  
Sal—Salisbury  
Sch—Schebler  
Sci—Scintilla

See—Scoe  
Sne—Snead  
Sp—Circulating Splash  
Spe—Special  
Spl—Spicer  
Spl—Splitorf  
S. E.—Standard Equipment  
Sta—Standard  
Ste—Stewart  
Stl—Sterling  
Str—Stromberg  
T—T Head  
The—Thermoid  
Thi—Thiener  
Til—Tillotson  
Tim—Timken  
Uni—Universal  
V—Cantilever  
W-G—Warner Gear  
W-M—Willys-Morrow  
Wag—Wagner  
War—Warner  
Weid—Weidley  
Wes—Westinghouse  
Wis—Wisconsin  
X—Sleeve  
Zen—Zenith





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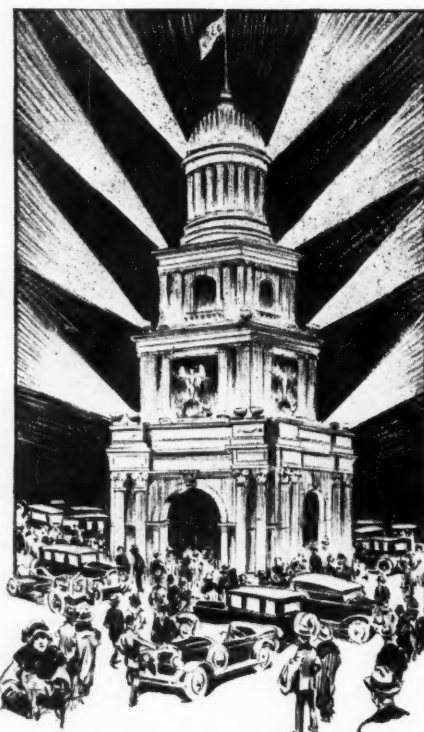
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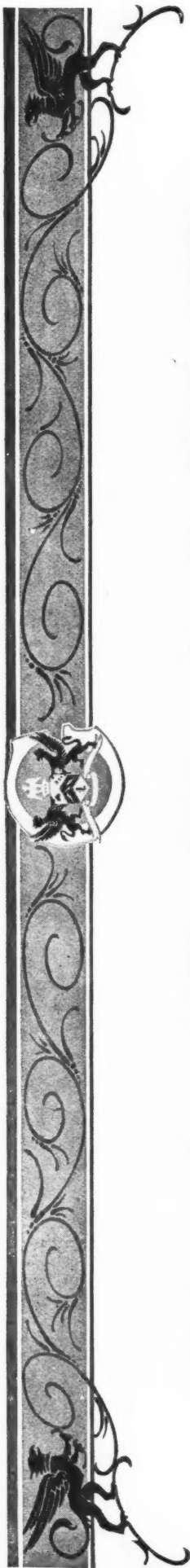
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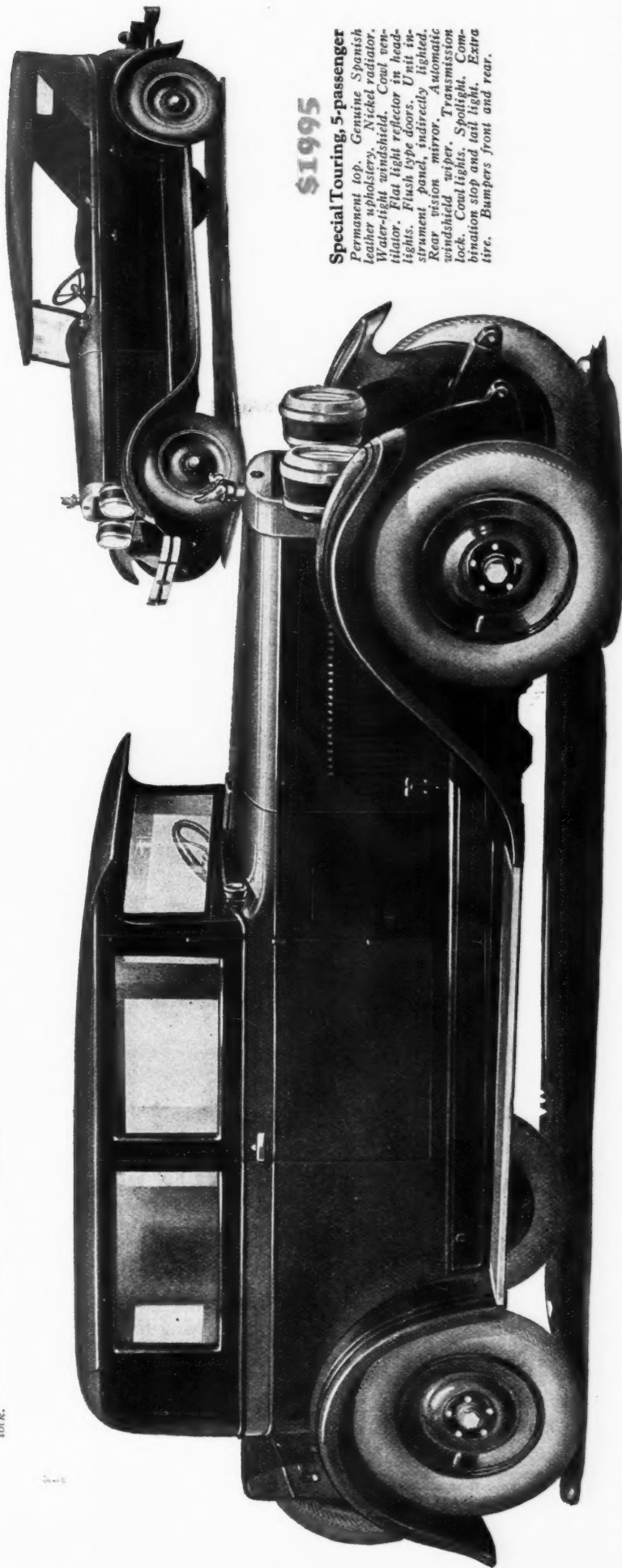
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**\$1995**

**Brougham—5-passenger**  
Not a coach. Not a makeshift. A real, extra fine closed car—big, roomy and comfortable. Beauty inside and out. Full plate glass—not crystal. Rich velour upholstery. One-piece, vertical, ventilating windshield. Unit instrument panel, indirectly lighted. Satin finish hardware. Automatic window lifts on four windows. Wide doors—31 inches—with walnut panels and double locks. Dome light. Automatic windshield wiper. Rear vision mirror. Finest construction—all closed joints. Bald-headed back and double belt line. Combination stop and tail light. Flush type coil ventilator. Nickel radiator. Transmission lock.

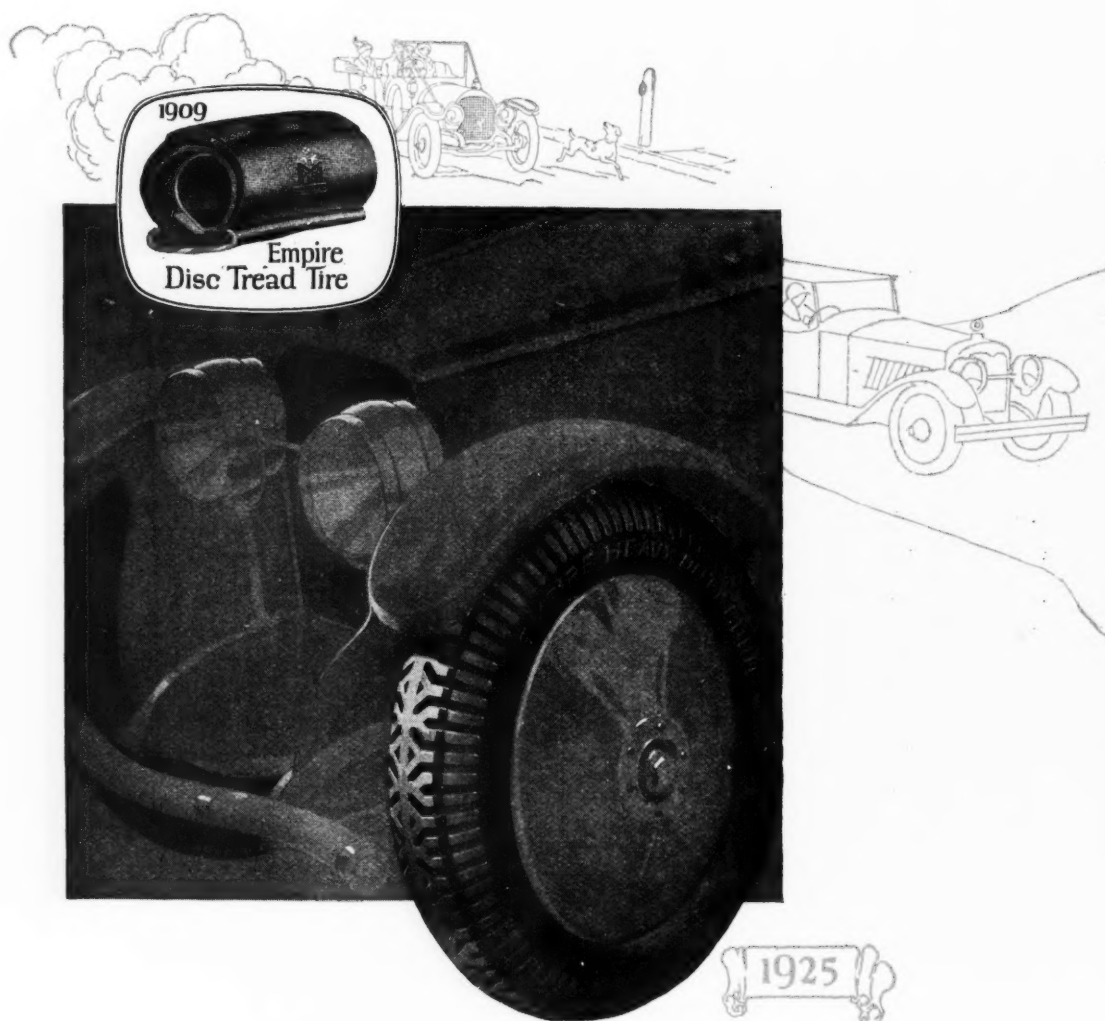


**\$1995**

**Special Touring, 5-passenger**  
Permanent top. Genuine Spanish leather upholstery. Nickel radiator. Water-tight windshield. Cool ventilator. Flat light reflector in headlights. Flush type doors. Unit instrument panel, indirectly lighted. Rear vision mirror. Automatic windshield wiper. Transmission lock. Cool lights. Spotlight. Combination stop and tail light. Extra tire. Bumpers front and rear.



# Anniversary



## Empire Heavy Duty Cords

Fifty per cent longer mileage.

More rugged than any other tires of corresponding sizes.

Tread brought completely down side wheel to serve as extra reinforcement and prevent curb and rut wear.

A layer of live rubber between each ply to give extra resiliency.

Require 40 per cent less air pressure, thus giving balloon comfort without the increased puncture hazard of the regular balloon tire.

Non-skid under the most severe conditions.

**EMPIRE TIRE AND**  
TRENTON



# Model



HE Silver Anniversary of the tire industry finds the Empire Tire and Rubber Corporation with a worthy example of the enormous strides made in that great field.

With pardonable pride we point to the comparisons reproduced on the opposite page—the Empire Disc Tread Tire of 1909 and the Empire Heavy Duty Cords, true 1925 models, which typify the demand of the careful dealer and consumer of today for extra mileage, extra weight and extra appearance.

And of as great importance to the dealer is the fact that, because of strict curtailment of overhead and unnecessary expense, he can buy these handsome rugged casings, at a price no higher than he has been paying for ordinary cords and sell them at a large and generous profit.

Start 1925 Right. Send for our exclusive dealer proposition.



**RUBBER CORPORATION**  
NEW JERSEY

# This system has set new standards of motor performance—

**L**ET'S get this straight right off the bat. The Swan System *is not* just another carburetor. It's a revolutionary forward step in motor carburetion.

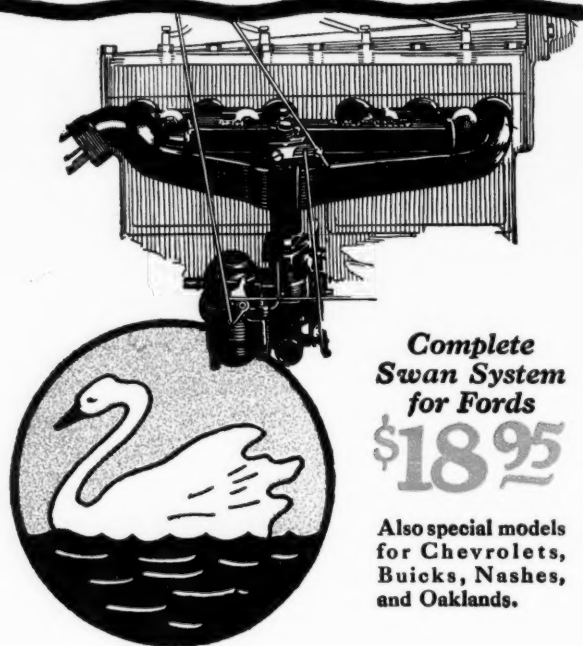
It does everything we claim for it—and *considerably* more!

This system was first engineered and designed for higher priced cars. Now a model has been especially developed for Fords. On any Ford that is mechanically right, it will save 20 to 30% in gas. But more important—it will make Ford performance amazingly smooth and sweet. It gives that wonderful little motor more power to take the hills on high, and makes it pick up like a six. Nice, easy driving in traffic. Less wear and tear on the transmission, clutch and universal.

And it's all due to a perfect mixture evenly distributed. Unlike other carbureting devices the Swan System does not depend on carburetor performance alone—it provides a proper fuel mixture in the carburetor, and then delivers this fuel in uniform and equal portions to each cylinder.

As a dealer, you know the demand for a system such as this. With the Ford model, and four other special re-installation outfits, you can serve over three cars out of every five. When you see this remarkable system perform, you'll admit that it truly sets an entirely new standard of motor car performance. There is a real opportunity for service stations and dealers who handle Swan Systems. Write us now for more information.

THE SWAN CARBURETOR CO., Cleveland, Ohio  
Subsidiary of The Perfection Heater & Mfg. Co.



Complete  
Swan System  
for Fords  
**\$18<sup>95</sup>**

Also special models  
for Chevrolets,  
Buicks, Nashes,  
and Oaklands.

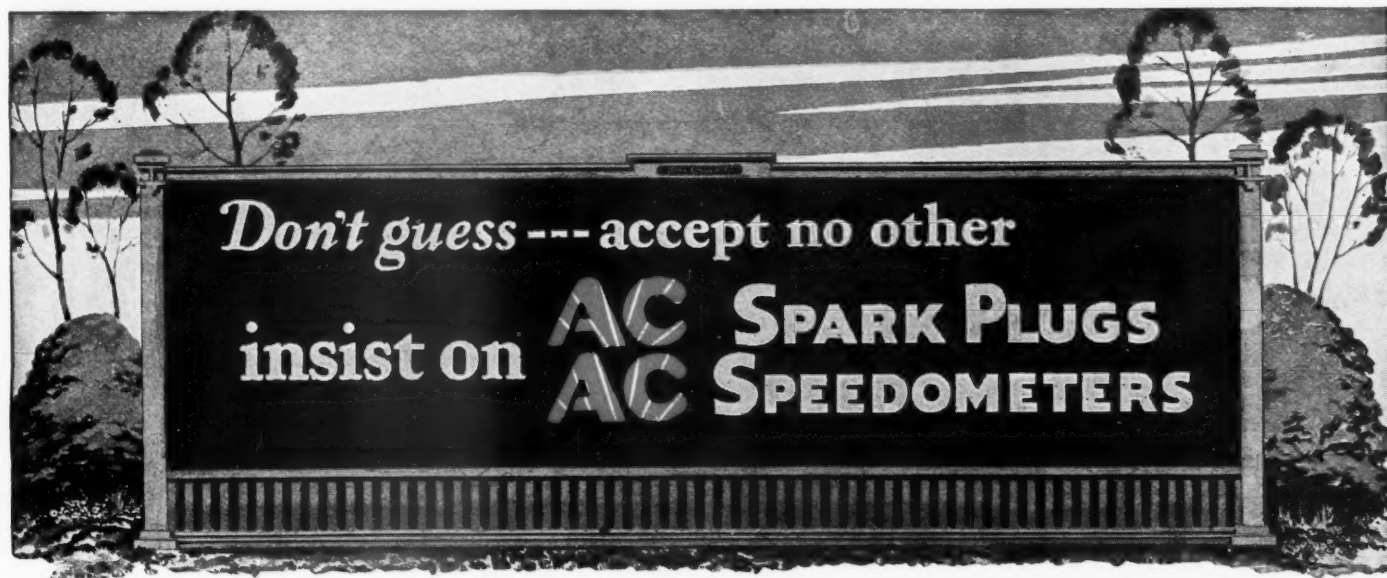
*The enthusiastic endorsement  
of automotive engineers is evi-  
denced by the many new models  
of well-known makes which are  
coming out Swan-equipped.*

# Swan System

## Carburetor and Fuel Distributor



# These Painted Boards Are Working For You Everywhere—Every Day



## What Plan Have You to Take Advantage of Advertising

**T**HE experienced accessory dealer is interested only in nationally known lines of proved quality.

AC Spark Plugs and AC Speedometers are of proved quality—and they are nationally advertised through magazines, painted boards, newspapers and by many other means. This national advertising makes them well known to the public, reduces sales resistance and makes them easy for the

dealer to sell.

Dealers can greatly increase their business by watching AC's advertising, displaying AC merchandise, and by identifying their store more closely with the popularity and prestige of the AC line.

When they do this and follow it up by using the sales thoughts contained in the advertising, they then will get the full benefit of the AC national program.

*Sell AC Products—Their Quality and Popularity Assure Demand and Profit*

AC-SPHINX  
Birmingham  
ENGLAND

AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915; U. S. Pat. No. 1,216,139,  
Feb. 13, 1917. Other Patents Pending

AC-OLEO  
Levallois-Perret  
FRANCE

# WRENCHES

**The Famous Mechanics' "D" Set**

Contains twenty-three Sockets from 9/32 to 30/32, which includes our handy "A" set for carburetor and ignition work. Also heavy Ratchet Wrench, sliding adjustable Tee Handle, Universal Joint and three Extension Bars, 1 inch, 1 1/4 inch, and 4 inch. Including heavy gauge steel box enameled in orange color.

**List**  
**\$15<sup>50</sup>**  
**Complete**

**THIS** is an all purpose set for every-day use—one that the mechanic can take from one job to another and one outfit with which he can handle all ordinary repair jobs!

The sockets are graduated in 1/32 inch sizes to fit all nuts from 9/32 to 30/32 inches. Burred nuts, rounded nuts, painted nuts, there's always a slightly larger or smaller socket to get 'em! That's the big reason for graduating the sizes 1/32 inch apart.

And the equipment of bar and ratchet handles, universal joint, etc., makes all nuts easily "get-at-able." The deep, thin wall Bethlehem Sockets are broached

from solid bars of special Bethlehem alloy steel and carefully machined. Cyanide hardened, chamfered and tapered. Surface copper oxidized and burnished.

All included in a convenient, husky, heavy gauge, enameled steel box which makes a real tool box for the mechanic.

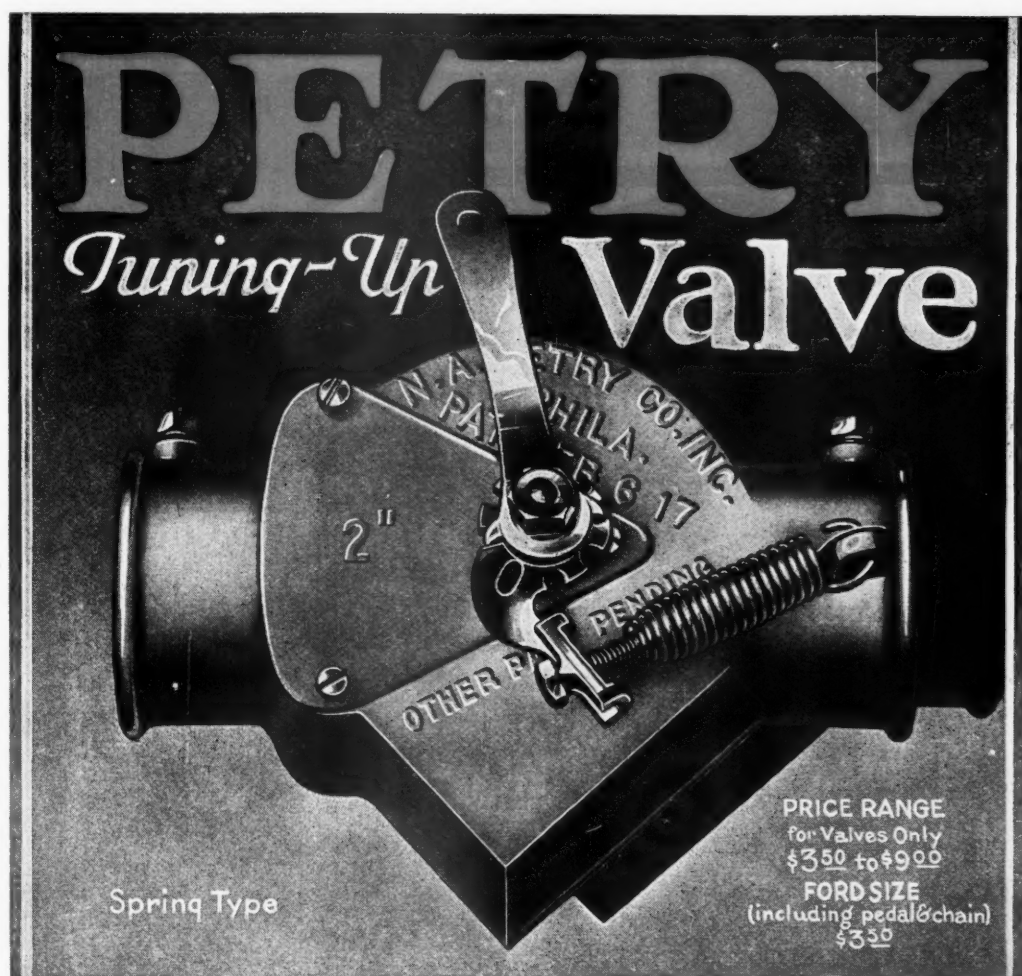
Order from your jobber. This set is going big with mechanics and those car owners who like good tools.

**BETHLEHEM SPARK PLUG CO.**

Bethlehem, Penna.

*E. H. Schwab, President*





*America's Best Scientific Detector—a necessity for the proper care of the engine.*

### ***Exclusive features make this cut-out easier to sell***

An accessory with outstanding features and scientific design like the PETRY Tuning-up Valve is immediately appreciated by your customer. He can see for himself the strong sturdy construction, snug fitting and rattle free, the high grade machining, the exceptional design. That's what we mean when we say that PETRY quality and features help you sell more cut-outs.

It pays to stock and sell PETRYS exclusively. Most jobbers carry them, or write us direct for terms, prices, etc.

#### **N. A. PETRY COMPANY, INC.**

340 North Randolph St.

Philadelphia, Pa.

*Pacific Coast Representative*

Norman Cowan Co., 451 Rialto Bldg., San Francisco, California.

### ***The PETRY Tuning-Up Valve FOR FORDS***

A well built, scientifically designed cut-out that will operate smoothly and efficiently and will not get out of order.

The spring is located away from the heat and is air cooled. It will keep its temper indefinitely.

The deep bored ends of the valve fit the exhaust pipe exactly. They make a leak-proof, rigid joint. No part of the PETRY will rattle.

The model shown sells for

**\$3.50**

*complete with pedal and chain*





The best place to put an Empire cold punched nut is on an Empire *New Process* bolt [*Then bolting troubles vanish*] A nut that is cold punched, chamfered, trimmed and burnished with one unchanging set-up mated to a bolt whose *built up* thread gauges to within .0005", produces a clean fitting combination that spells the end of labor waste, time loss, scrap.

## **RUSSELL, BURDSALL & WARD**

### **BOLT & NUT COMPANY**

**PORT CHESTER, N.Y.**

PEMBERWICK, CONN.

CHICAGO

SAN FRANCISCO

ROCK FALLS, ILL.

*Makers of Bolts, Nuts and Rivets Since 1845*



# ATWATER KENT

SCIENTIFIC IGNITION



## *A Source of Daily Profit*

PROGRESSIVE automotive dealers have found that ATWATER KENT IGNITION offers the ideal means of satisfying the ever-increasing demand for a dependable Ford ignition system.

Because of the ATWATER KENT reputation for accuracy, sturdiness and dependability, Type LA is a replacement unit whose value is instantly recognized by the Ford owner—and whose quick sale and easy installation features present to the dealer a source of daily profit.

ATWATER KENT MANUFACTURING COMPANY

4733 Wissahickon Ave., Philadelphia, Pa.

Price  
\$10<sup>80</sup>

Including cables  
and fittings





Another  
Christmas  
Suggestion

**McKAY**  
TIRE CHAINS  
The Better  
Black Chains  
in the  
Red Band Bag

**McKAY TIRE CHAINS**

**MCK** *And Now*  
**McKAY RED BEAD BUMPERS**



UNITED STATES CHAIN & FORGING COMPANY, Union Trust Building, Pittsburgh, Pa.

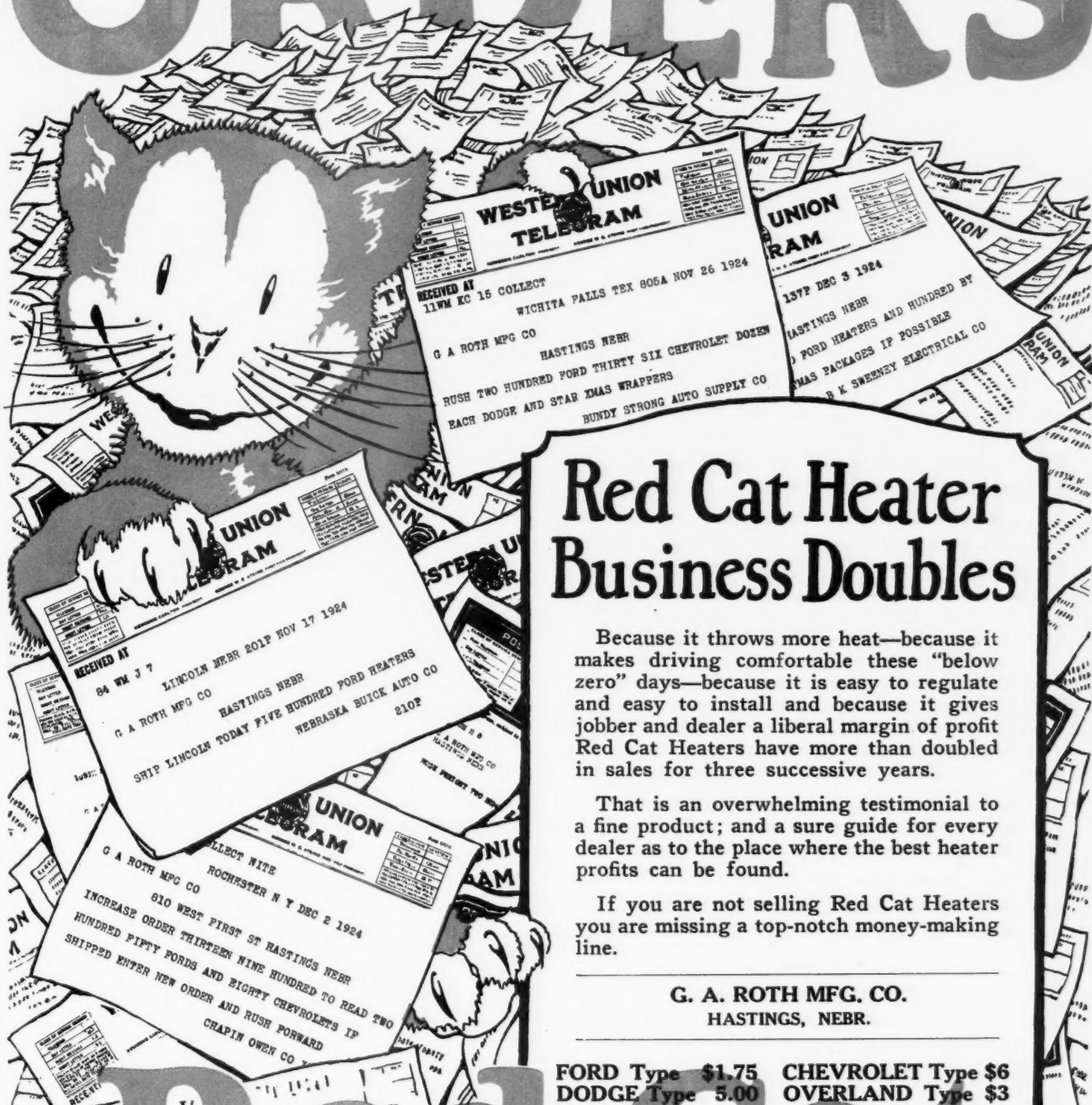
Makers of McKay Tire Chains, McKay Shurout Chains, McKay Red Bead Bumpers

Pacific Coast Sales Representatives: NORMAN COWAN CO., 451 Rialto Building, San Francisco, Cal.

Be Sure to See the Exhibit of McKay Tire Chains and McKay Red Bead Bumpers at the National Automobile Shows  
NEW YORK, Jan. 2d to 10th—Spaces 66 and 67 CHICAGO, Jan. 23d to 31st—Spaces 113 and 114



# ORDERS



**WESTERN UNION TELEGRAM**  
RECEIVED AT 11PM KC 15 COLLECT  
WICHITA FALLS TEX 805A NOV 26 1924  
G A ROTH MFG CO  
HASTINGS NEBR  
RUSH TWO HUNDRED FORD THIRTY SIX CHEVROLET DOZEN  
EACH DODGE AND STAR XMAS WRAPPERS  
BUNDY STRONG AUTO SUPPLY CO

**UNION TELEGRAM**  
137P DEC 3 1924  
HASTINGS NEBR  
FORD HEATERS AND HUNDRED BY  
XMAS PACKAGES IF POSSIBLE  
R K SWEENEY ELECTRICAL CO

**UNION TELEGRAM**  
RECEIVED AT 84 PM J 7  
LINCOLN NEBR 201P NOV 17 1924  
G A ROTH MFG CO  
HASTINGS NEBR  
SHIP LINCOLN TODAY FIVE HUNDRED FORD HEATERS  
NEBRASKA BUICK AUTO CO  
210P

**UNION TELEGRAM**  
COLLECT NITE  
ROCHESTER N Y DEC 2 1924  
G A ROTH MFG CO  
810 WEST FIRST ST HASTINGS NEBR  
INCREASE ORDER THIRTEEN NINE HUNDRED TO READ TWO  
HUNDRED FIFTY FORDS AND EIGHTY CHEVROLETS IF  
SHIPPED ENTER NEW ORDER AND RUSH FORWARD  
CHAPIN OWEN CO

## Red Cat Heater Business Doubles

Because it throws more heat—because it makes driving comfortable these “below zero” days—because it is easy to regulate and easy to install and because it gives jobber and dealer a liberal margin of profit Red Cat Heaters have more than doubled in sales for three successive years.

That is an overwhelming testimonial to a fine product; and a sure guide for every dealer as to the place where the best heater profits can be found.

If you are not selling Red Cat Heaters you are missing a top-notch money-making line.

**G. A. ROTH MFG. CO.**  
HASTINGS, NEBR.

**FORD Type \$1.75    CHEVROLET Type \$6**  
**DODGE Type 5.00    OVERLAND Type \$3**

# Red Cat HEATERS

# OFF'N'ON CHAINS



## Advertisements that Make Sales

**C**HAIN WEATHER is here and so is the demand for **OFF'N'ON** Chains. We know this because the twenty-five million messages we are sending through the national magazines are bringing requests for these chains every day.

"Where can we get these chains that can be put on or taken off without tools?" That's the question we are asked and we answer it by referring all inquirers to dealers stocked with **OFF'N'ON** Chains.

Be ready with a stock of **OFF'N'ON** Chains to meet the demand in your territory.

**OFF'N'ON** Chains in regular and balloon sizes.

### PYRENE MANUFACTURING COMPANY

Newark, New Jersey

CHICAGO ATLANTA KANSAS CITY SAN FRANCISCO

*Makes Safety Certain*

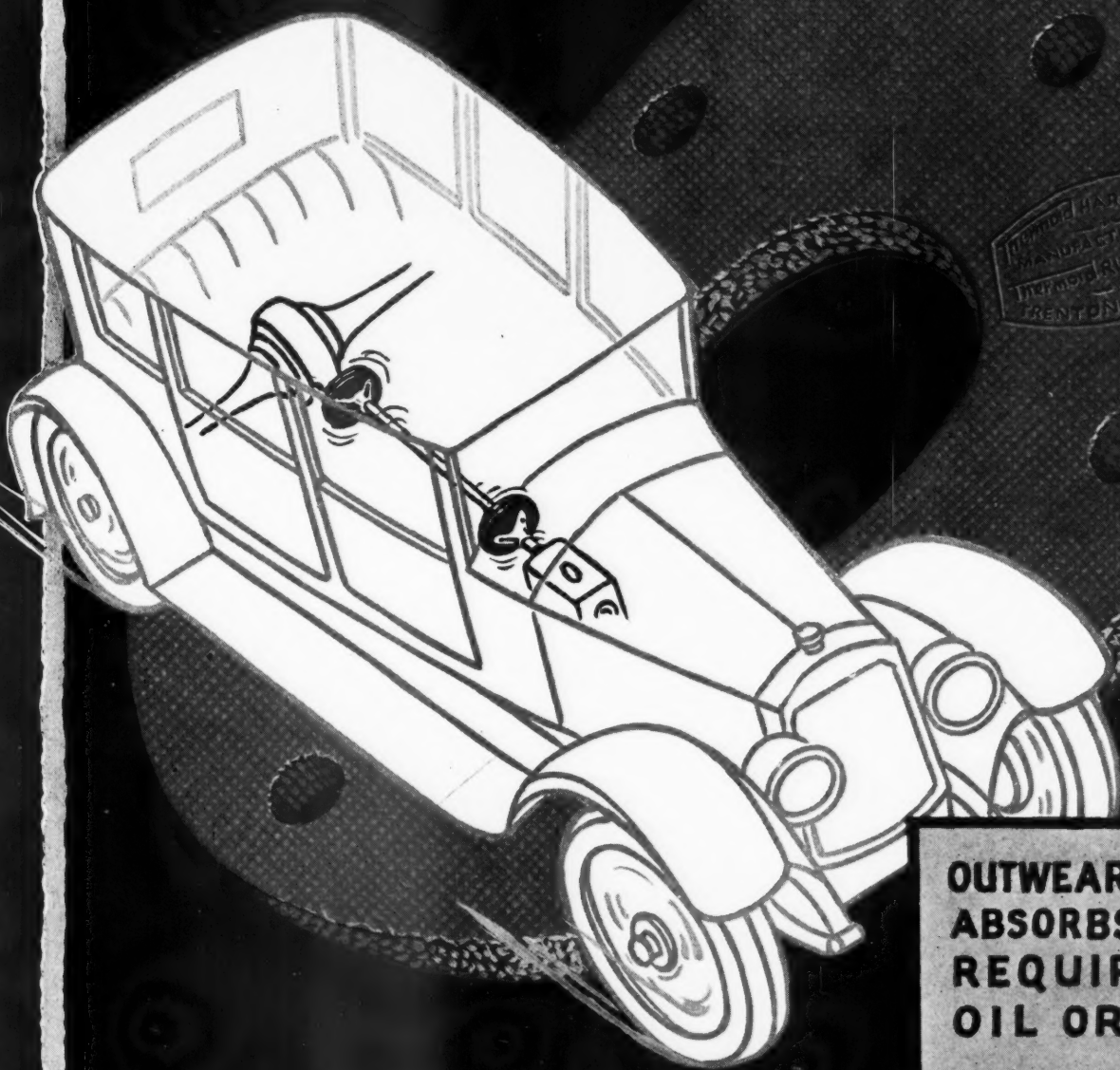
*Makers of Pyrene Fire Extinguishers*



24

# ITS FLEXIBILITY

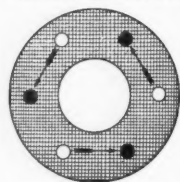
**SAVES WEAR ON  
WORKING PARTS**



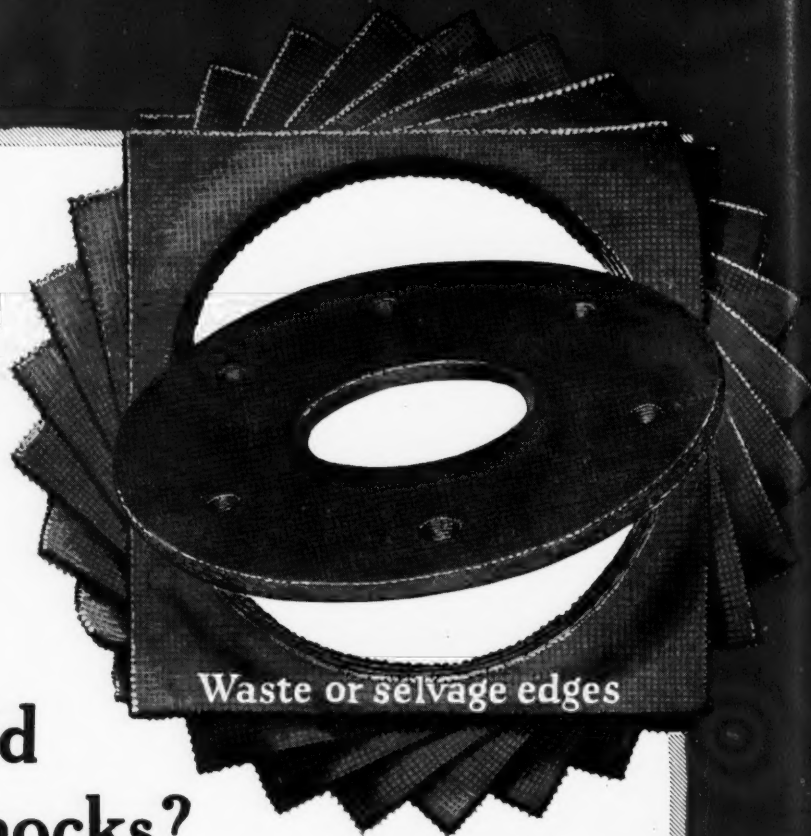
**OUTWEARS METAL  
ABSORBS JOLTS  
REQUIRES NO  
OIL OR CARE**

## Thermoid-Hardy Universal Joint

The threads in an ordinary fabric joint run in two directions only. (See diagram.)



The threads in a Thermoid-Hardy run in every direction, adding immensely to its strength and ruggedness, just as the spokes of a wheel add to the strength and trueness of the rim.



Waste or selvage edges

## Why Not Avoid Avoidable Shocks?

**T**HE modern tendency is toward the elimination of vibration and shock. Hence the turbine engine, the shock absorber, the rubber heel—and the Thermoid-Hardy.

The best of metal universals can only *approach* the elasticity of Thermoid-Hardy. No metal joint can equal Thermoid-Hardy in silence of operation and long, frictionless wear.

The shock-absorbing properties of Thermoid-Hardy are especially noticeable in starting a car. Every time you throw in the clutch the engine is called on to move a ton or more of dead weight. With a metal joint the result is a sudden wrench on gears, shaft, bearings, axle and engine. Thermoid-Hardy's flexibility reduces this wrench to a smooth, easy pull. In operation Thermoid-Hardy absorbs vibrations and jolts traveling between engine and driving gear.

A prominent engineer has stated that in his opinion the Thermoid-Hardy can increase the life of a car's working parts as much as fifty per cent.

**THERMOID RUBBER COMPANY, Trenton, N. J.**

New York, Chicago, Los Angeles, Detroit, Atlanta, Seattle, Kansas City,  
Boston, San Francisco, Cleveland, London, Paris, Turin

*Makers of Thermoid Brake Lining, Rexoid Transmission  
Lining, Thermoid Tires*

### Some Thermoid-Hardy Users

Allis Chalmers Mfg. Co.  
American Bosch Magneto Co.  
American Motors Corp.  
Anderson Motor Co.  
The Autocar Co.  
Available Truck Co.  
Barley Motor Car Co. (Roamer)  
Bartlett Motor Truck Co.  
Chandler Motor Car Co.  
Cleveland Automobile Co.  
Continental Motor Co.  
Cooks Motor Corp.  
Cowan Truck Co.  
Crow-Elkhart Motor Corp.  
Jas. Cunningham Son & Co.  
Curtiss Aeroplane & Motor Co.  
Dart Truck & Tractor Corp.  
Day-Elder Motor Co.  
Diamond T Motor Car Co.  
Doane Motor Truck Co.  
Dort Motor Car Co.  
H. H. Franklin Mfg. Co.  
Garford Motor Truck Co.  
Gramm-Bernstein Motor Truck Co.  
Gray Motors Corp.  
Hatfield-Penfield Steel Co.  
Hawkeye Truck Co.  
Haynes Automobile Co.  
Hendrickson Motor Truck Co.  
Holt Mfg. Co.  
Hupp Motor Car Corp.  
Indiana Truck Co.  
International Harvester Co., of A., Inc.  
International Motor Co.  
Jackson Motors Corp.  
Jordan Motor Car Co.  
Kelly-Springfield Motor Truck Co.  
Kentucky Wagon Mfg. Co., Inc.  
Kissel Motor Car Co.  
Locomotive Co.  
Maxwell Motors Corp.  
McFarlan Motor Car Co.  
Merer Motors Co.  
Moreland Motor Truck Co.  
Nelson & LeMoon  
E. A. Nelson Automobile Co.  
O'Connell Motor Truck Co.  
Olds Motor Works  
Packard Motor Car Co.  
Parker Motor Truck Co.  
Patriot Motors Co.  
Pierce-Arrow Motor Car Co.  
Reo Motor Car Co.  
Republic Motor Truck Co.  
Rochester Motor Corp.  
Root & Van Dervoort Eng. Co.  
Sanford Motor Truck Co.  
Stewart Motor Corp.  
Stoughton Wagon Co.  
Studebaker Corp.  
Superior Products Mfg. Co.  
Traffic Motor Truck Co.  
Transport Truck Co.  
United Motors Co.  
Velle Motor Corp.  
Walter Motor Truck Co.  
Wichita Motors Co.  
Wilcox Trux Co.  
Willys-Overland, Inc.  
Worthington Pump & Machinery Corp.  
Yellow Cab Co.

# Thermoid-Hardy Universal Joint



## ONE PISTON WILL NOT FIT ALL CYLINDERS

Neither will one type or size of Carburetor fit all motors.

### Special Stromberg Carburetors

are engineered and designed particularly to meet the individual characteristics of each make or model of passenger car or truck.

### A Special Stromberg Carburetor

will make the greatest possible improvement in the operation of every car.

The perfect motor car performance can never be realized without one of these

### Special Stromberg Carburetors

Start easy in cold weather—get-a-way like a shot—more power—smoother running and greatest economy in gasoline consumption.

130 representative American manufacturers use them as standard equipment.

## SPECIAL STROMBERG CARBURETORS

are EASILY INSTALLED and are built with a precision which GUARANTEES SATISFACTION.

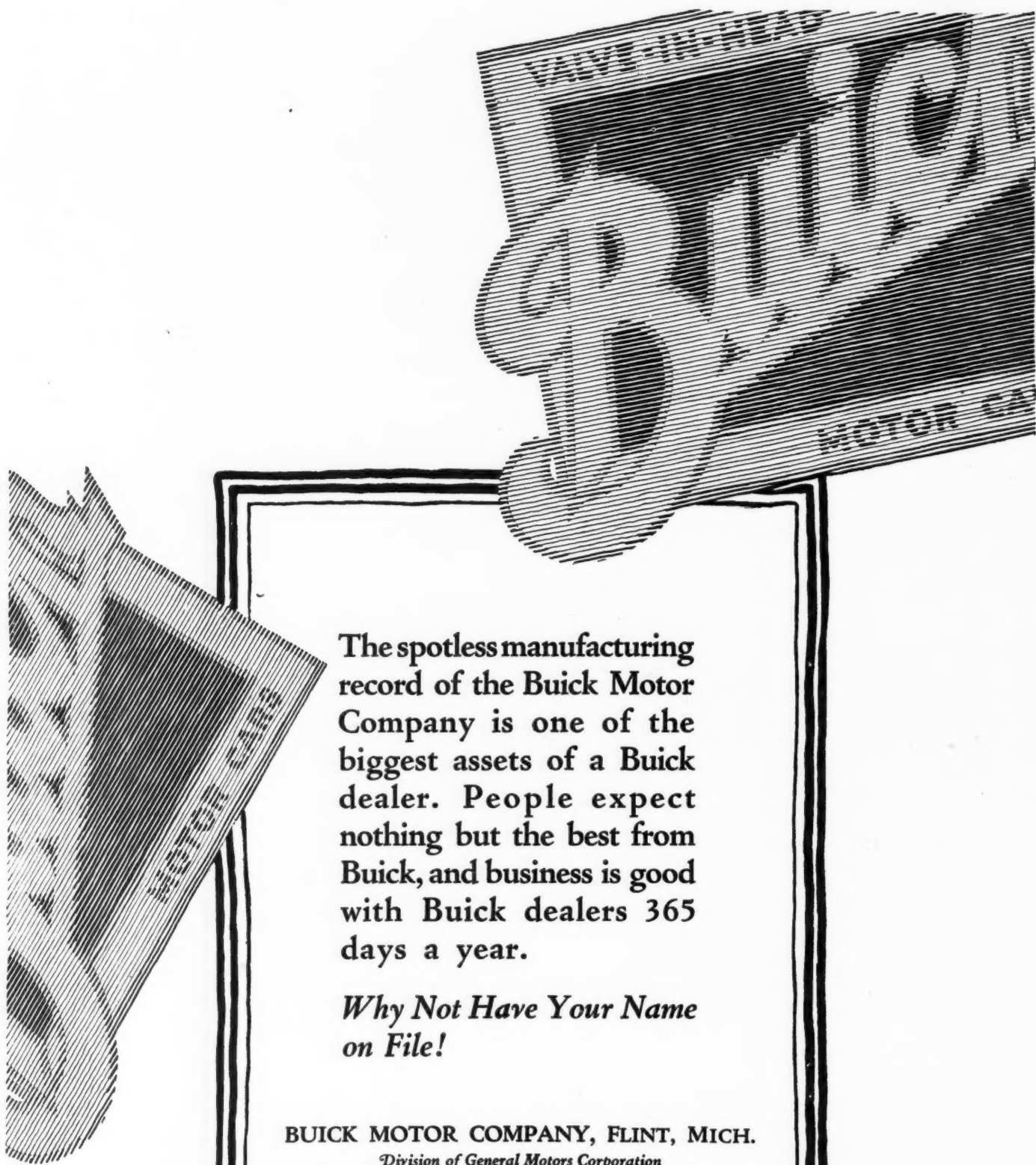
### Prices of complete special equipments:

|                     |         |                         |         |
|---------------------|---------|-------------------------|---------|
| Buick . . . . .     | \$24.00 | Hudson . . . . .        | \$28.50 |
| Cadillac . . . . .  | 32.50   | Jewett . . . . .        | 24.00   |
| Chandler . . . . .  | 24.00   | Maxwell . . . . .       | 19.50   |
| Chevrolet . . . . . | 19.50   | Nash . . . . .          | 22.50   |
| Dodge . . . . .     | 19.00   | Oakland . . . . .       | 22.50   |
| Dort . . . . .      | 18.50   | Oldsmobile . . . . .    | 19.50   |
| Durant . . . . .    | 19.00   | Overland . . . . .      | 17.50   |
| Essex . . . . .     | 24.50   | Reo . . . . .           | 24.50   |
| Ford . . . . .      | 15.75   | Star . . . . .          | 18.00   |
| Gardner . . . . .   | 18.50   | Willys-Knight . . . . . | 19.00   |

You dealers who are progressive—who realize the substantial business that the Special Stromberg Carburetor will build for you, must not delay. Write or wire. Do it now. Ask for attractive sales proposition. Make big money. Remember now's the time to get busy.

THE STROMBERG MOTOR DEVICES COMPANY

65 East 25th Street  
CHICAGO



The spotless manufacturing record of the Buick Motor Company is one of the biggest assets of a Buick dealer. People expect nothing but the best from Buick, and business is good with Buick dealers 365 days a year.

*Why Not Have Your Name  
on File!*

**BUICK MOTOR COMPANY, FLINT, MICH.**

*Division of General Motors Corporation*

Pioneer Builders  
of Valve-in-Head Motor Cars

Branches in  
All Principal Cities—Dealers Everywhere

WHEN BETTER AUTOMOBILES ARE BUILT, BUICK WILL BUILD THEM



# NO-LEAK-O Piston Rings

Plus—reputation  
Plus—factory service

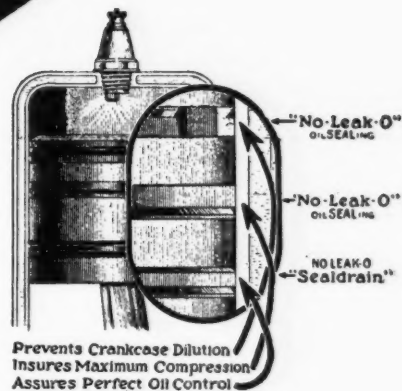


No-Leak-O Piston Rings, with the famous 45° oilSEALing groove, need no introduction. Their efficiency as an oil control ring, their accuracy, ease of installation, and the unfailing long service which they render are well known in the industry.

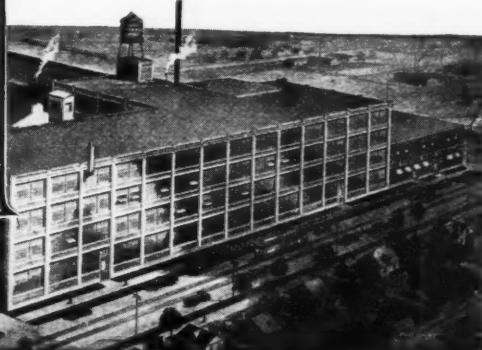
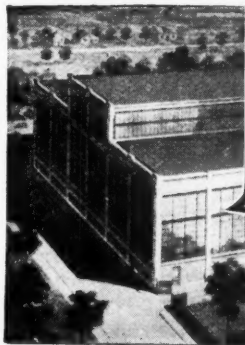
They are made by The Piston Ring Company, the world's largest manufacturers of piston rings—an additional guarantee of quality. The Piston Ring Company could not afford to risk its reputation on any ring whose merit could be questioned.

The recent consolidation of the No-Leak-O Piston Ring Company and the Piston Ring Company means economies in manufacturing that will benefit jobber and dealer alike. And it places a complete piston ring service at their disposal which cannot be offered by any other Piston Ring Company in the world.

Service Division — Oil Ring Dept.



*The Piston*  
RING COMPANY  
Muskegon, Michigan



The Sign of  
"Friendly Service"



Service Stations  
Everywhere

# Dominating Your Battery Market

## For Radio

Prest-O-Lite Storage Batteries for Radio include a superior specialized battery for every radio use. Each combines important exclusive advantages with the famous Prest-O-Lite quality. This wide range of models enables you to meet the needs of every prospect, no matter what the requirements of his particular set.

You can offer values that are unmatched. A 65 A. H. capacity Standard Prest-O-Lite "A" Battery sells as low as \$12.45. A Prest-O-Lite Super-Service "B" Battery can be purchased for as little as \$9.90. Customer satisfaction is made certain by standard Prest-O-Lite quality.

The Prest-O-Lite Radio Storage Battery proposition is sound and unusually attractive. The unmatched values, quality and completeness of line will enable you to be the outstanding figure of the radio storage battery business in your section.

## For Automobiles

With the price of \$14.65 for the same Standard Prest-O-Lite 6-Volt Full Capacity Storage Battery which formerly sold for \$20.50 you can dominate the battery business in your territory.

Remember, this is the improved Standard Full Capacity Prest-O-Lite Battery that has become famous as standard equipment on a growing number of America's most famous cars.

When you offer this internationally famous Prest-O-Lite Battery at this new low price your sales on all lines are bound to leap upward because you will attract an increasing number of car owners.

This price of \$14.65, made possible because of our enormous resources, experienced organization, and modern manufacturing and distribution methods, puts you beyond reach of all competition.

THE PREST-O-LITE COMPANY, Inc.  
INDIANAPOLIS, IND.

New York Office: 30 East 42nd Street

Pacific Coast Factory: 599 Eighth Street, San Francisco

Canadian Factory: Prest-O-Lite Company of Canada, Ltd., Toronto, Ont.





DURANT MOTORS INC

Without Fail

*see the*

New Star Motor

*at the*

National Automobile Shows

*and*

LEARN ALL ABOUT

*The Car for the Millions*

WITH

*The Million Dollar Motor*

DURANT MOTORS · INC.

Broadway at 57th Street, New York

STAR PLANTS: · ELIZABETH, N. J. · LANSING, MICH. · OAKLAND, CAL. · TORONTO, ONT.

THE CAR FOR THE MILLIONS

THE MILLION DOLLAR MOTOR

# GATES HOSE

*"The Standardized Radiator Hose"*



Marked by Inches  
Easily Cut to Length

We are now making and shipping  $3\frac{1}{2}$  miles of radiator hose every day. It's the tougher rubber lining of Gates Vulco hose—giving your customers better service—that has made this record possible.

Made by the World's Largest  
Manufacturers of Fan Belts.



# 3 Tubes DO THE WORK OF 6



Crosley Trirdyn Special, \$75.00  
With tubes and Crosley Phones \$90.75

## In the CROSLEY Trirdyn

SINCE the inception of radio, the results obtained with Armstrong Regenerative Receivers have been the goal of comparison for all others. Trick circuits have been designed to get around the Armstrong Patent hoping to obtain results "just as good." This has resulted in the use of more tubes, necessary without, but unnecessary with regeneration.

This is one reason why Crosley Radios, licensed under Armstrong U. S. Patent No. 1,113,149 have performed everywhere so remarkably on so few tubes.

The Crosley Trirdyn, employing Armstrong Regeneration combined with tuned non-oscillating radio frequency amplification and reflexed audio frequency amplification and using only three tubes, consistently gives greater selectivity, more volume and wider range than can be obtained where five or six tubes are employed without regeneration. With no regeneration, two stages of radio frequency amplification, requiring at least two additional tubes, must be employed in front of the detector tube to get the same results as furnished by one tube where regeneration is used.

Every additional tube means additional expense; an added dial to tune, greater difficulty in operation, more distortion and more tube noises. The three tube Crosley Trirdyn has only two dials. These operate but two circuits, making tuning and logging very easy.

You can't beat the results obtained from an Armstrong Regenerative Crosley Radio. A trial will convince you.

**BEFORE YOU BUY—COMPARE  
YOUR CHOICE WILL BE CROSLEY  
For Sale By Good Dealers Everywhere**

*Crosley Regenerative Receivers are licensed under Armstrong U. S. Patent 1,113,149. Prices West of Rockies—Add 10%.*

*Write for Complete Catalog*

### THE CROSLEY RADIO CORPORATION

*Powell Crosley, Jr., President*

12533 Sassafras St.

Cincinnati, Ohio

*Crosley Owns and Operates Broadcasting Station WLW*

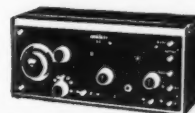
**CROSLEY**  
Better—Costs Less  
Radio



Crosley One Tube  
Model 50, \$14.50  
With tube and Crosley Phones \$22.25

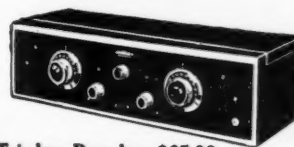


Crosley Two Tube  
Model 51, \$18.50  
With tubes and Crosley Phones \$30.25



Crosley Three Tube  
Model 52, \$30.00  
With tubes and Crosley Phones \$45.75

Crosley  
Head Phones  
Better—Cost Less  
\$3.75



Crosley Trirdyn Regular, \$65.00  
With tubes and Crosley Phones \$80.75



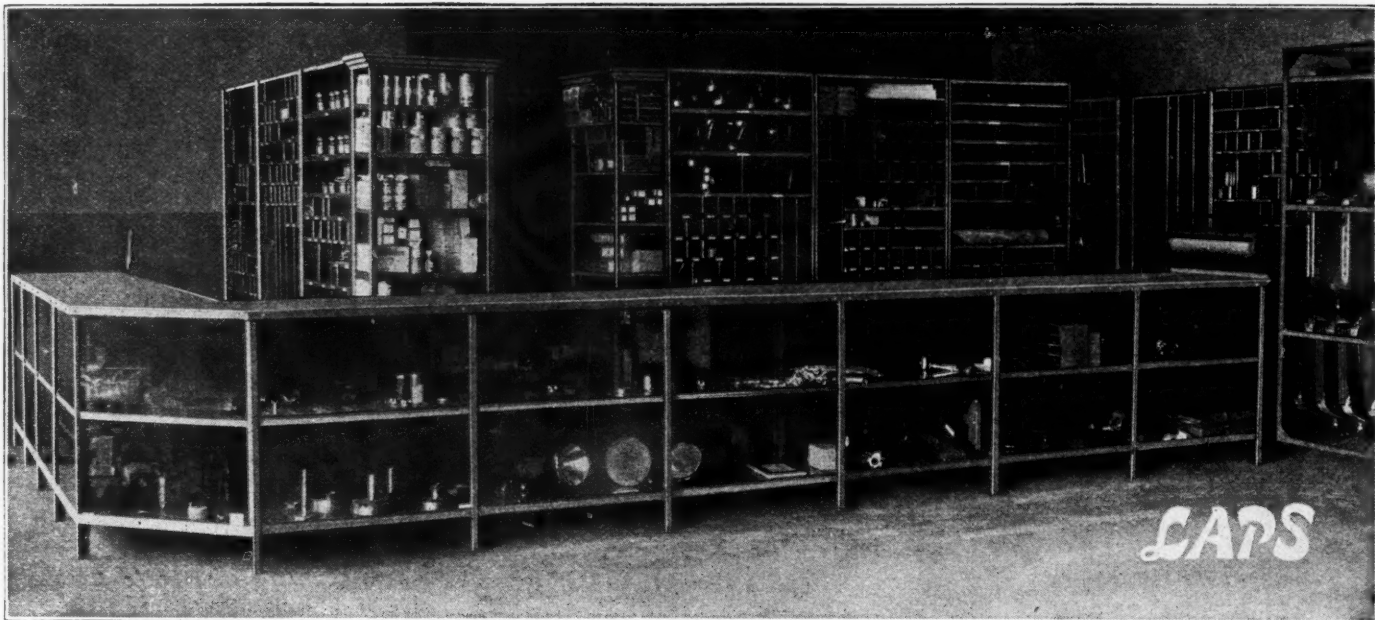
Crosley Trirdyn Newport, \$100.00  
With tubes and Crosley Phones \$115.75

Mail  
This  
Coupon  
At Once

The Crosley  
Radio Corp'n  
12533 Sassafras St.  
Cincinnati O  
Mail me, free of  
charge, your catalog  
of Crosley receivers  
and parts

Name \_\_\_\_\_

Address \_\_\_\_\_



## LAPS Systems save your time in stocking parts and selling them



GUST W SANDIN *Ford* FRED SANDIN  
*The Lupton Auto Company*  
 TRUCKS - TRACTORS  
 AUTHORIZED SALES & SERVICE  
 AURORA, NEBRASKA

David Lupton Sons,  
 2631 Woodward Avenue,  
 Detroit, Michigan.

May 27, 1924.

Gentlemen:

Last fall we installed the Lupton System of steel shelving for Ford parts. At that time we installed the car and truck units and a little later the steel show case made by your company. This spring we have installed the tractor units.

We are certainly more than pleased with the Lupton System. Nothing could be more compact than this system. It is easy to keep the stockroom neat and clean at all times.

We believe that the greatest advantage of the system is the ease with which the stock can be checked up. The placing of the monthly stock shipments is accomplished in just a fraction of the time used under the old system.

The least we can say is that we heartily recommend the Lupton System of steel shelving to all Ford dealers.

Very truly yours,

SANDIN AUTO COMPANY.

*Gust W Sandin*

"—monthly stock shipments placed in a fraction of the time"

"—easy to keep the stockroom neat and clean"  
 "—more than pleased"

DAVID LUPTON'S SONS CO.  
 SALES OFFICE, 2631 Woodward Avenue, DETROIT  
 Main Office and Factory, PHILADELPHIA

# LUPTON AUTO-PARTS STORAGE





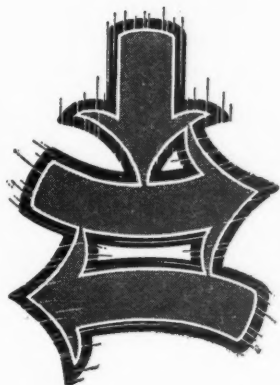
## For Those Front Wheels—

**W**HERE the destructive forces of load and road are most severe install tapered roller bearings which "stand up" and give care-free service.

In front wheels, as in other installations, the strong alloy steel construction of *Gilliam Tapered Roller Bearings* account for their miles and miles of remarkable performance and endurance.

No change is necessary in the surrounding parts—just install the *Gilliam Cup and Gilliam Cone* in the installation and you've made another satisfied customer.

Have you seen our latest price list and replacement size data?



The arrow symbol signifies the recognized ability of Gilliam Tapered Roller Bearings to carry all combinations of radial and thrust loads from all directions.

They are used as standard equipment in 74 makes of passenger cars and trucks.

Gilliam Bearings are made of high grade alloy steel.

The Gilliam Manufacturing Co.  
Canton,

Ohio

**GILLIAM**  
TAPERED ROLLER  
**Bearings**





# and that's why **ROSE** leads

Did you ever pump up a tire with a Rose Pump and feel the might of its long, powerful stroke? You bet there's a difference! Smooth, easy—not an ounce of wasted effort.

Rose has outsold all others for nine years now — and that's the reason.

Your jobber has them.

FRANK ROSE MFG. CO., Hastings, Nebr.

# **ROSE**

## **TIRE PUMP**

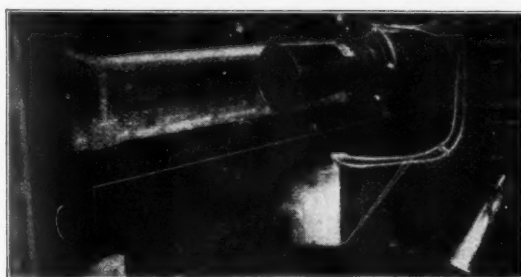


# Winter Weather is Profit Weather for FRANCISCO DEALERS

**A** GAIN this year the Francisco Auto Heater will be the biggest selling item in the accessory store! Each year its reputation and sales have climbed until it is now recognized as the most efficient heater made.

Cash in on the easy, large-volume sales—the quick turnover—and the big margin of profit that Francisco Auto Heaters hold for you. The Francisco Heater has been adopted as an equipment by General Motors Corporation and by the makers of the Packard, Rickenbacker, Lexington, Maxwell, Stutz and Columbia automobiles and the Anderson Body Co.

**Quickly and  
Easily In-  
stalled in  
Any Car**



**No Service  
Required  
From the  
Dealer**

## A Complete Line of Heaters for all Cars of Standard Make

The complete Francisco Line enables you to sell to all motorists. Installations are made in both open and closed cars for the Francisco supplies heat so generously that it is efficient even in the side curtained open car. The Liberal profit margin allowed Francisco Dealers and the unequalled popularity of this efficient heater makes it the ideal proposition for you to handle this winter. Don't delay getting the facts. Write your jobber today for literature, discounts and full details.

**The Francisco Auto Heater Co., Dept. 14, Columbus, Ohio**

### FRANCISCO HEATER PRICES — for All Makes of Cars

| List Prices as of September 1, 1924  |         | Flint '25                        |       | Olds Four '21-'24                 |       |
|--------------------------------------|---------|----------------------------------|-------|-----------------------------------|-------|
| American                             | \$10.00 | Ford Sheet Metal all models..... | 2.50  | Overland Four '20 to '25          | 5.00  |
| Anderson '22                         | 10.00   | Franklin Models 9 and 10 and 10C | 10.00 | Paisje 6-66                       | 10.00 |
| Auburn 7R and 8R Continental         | 10.00   | Gardner '23-'25                  | 10.00 | Peerless 6                        | 10.00 |
| Buick Four '22-'24                   | 10.00   | Gray '23-'25                     | 5.00  | Peerless 66                       | 20.00 |
| Buick Six '20-'24                    | 10.00   | Haynes                           | 10.00 | Pierce-Arrow Model 33 and 80..... | 10.00 |
| Cadillac 53, 55, 57, 59 & 61-63..... | 20.00   | Hudson '20-'25                   | 10.00 | Reo '21-'25                       | 10.00 |
| Chalmers '22-'24                     | 10.00   | Hupmobile '20-'25                | 10.00 | Reo Speed Wagon                   | 10.00 |
| Chandler '20-'25                     | 10.00   | Jewett '22-'25                   | 10.00 | Rickenbacker '22-'24              | 10.00 |
| Chevrolet 4-80                       | 5.00    | Jordan '21-'25, 6 and 8          | 10.00 | Rollin '25                        | 10.00 |
| Cleveland '21-'25                    | 10.00   | Kissel Kar                       | 10.00 | Star '23-'25                      | 5.00  |
| Columbia 6-Y Motor                   | 10.00   | Lexington Ansted '21-'25         | 10.00 | Stephens Salient Six '22-'25      | 10.00 |
| Chrysler '25                         | 10.00   | Maxwell '20-'25                  | 5.00  | Stearns-Knight '24-'25            | 10.00 |
| Davis 6-Y Motor                      | 10.00   | Mitchell '20-'25                 | 10.00 | Studebaker Light Six '21-'25      | 10.00 |
| Dodge, all models                    | 5.00    | Moon 6-Y Motor                   | 10.00 | Studebaker Big or Special Six     | 10.00 |
| Dort '22-'24                         | 10.00   | McFarlan                         | 10.00 | '19-'25                           | 10.00 |
| Durant Ansted '22-'25                | 10.00   | Nash Four '22-'24                | 10.00 | Stutz '20-'25                     | 10.00 |
| Durant Four '22-'25                  | 10.00   | Nash Six '20-'25                 | 10.00 | Vellie                            | 10.00 |
| Earl '23-'24                         | 10.00   | Oakland '20-'25                  | 10.00 | Wescott '24-'25                   | 10.00 |
| Essex '20-'25                        | 10.00   | Olds Eight '20-'24               | 20.00 | Willis-Knight '22-'25             | 10.00 |
|                                      |         | Olds Six '24-'25                 | 10.00 | Wills Ste. Claire '22-'25         | 20.00 |

# FRANCISCO

**AUTO HEATER**



**W**HEN a tire, always bearing a good reputation and a good sale, has been on the market twenty-five years, it does not at the end of that time increase its popularity beyond normal without good reason.

The way an always good demand for Fisk tires has grown during the past year or two is one of the outstanding events in the tire industry.

The unusual position enjoyed by the Fisk tires today is due to the quality of the product, the close contact of the makers with their dealers and liberal and consistent sales policy *and*—

**THE COMPLETENESS OF THE LINE** which literally includes a tire to fit every car, every road and every purse.

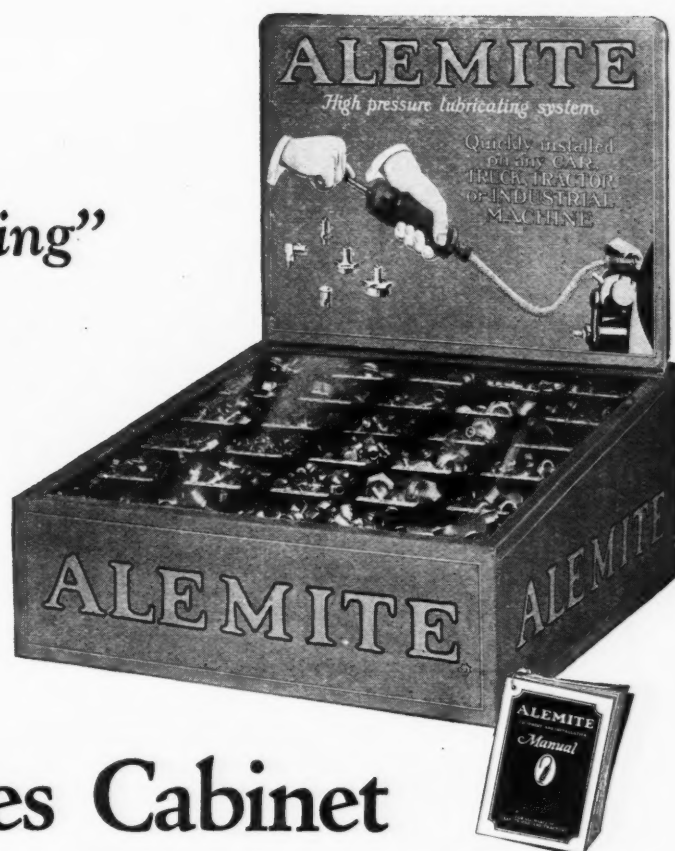
Take the 3½ inch group. There is a tire to compete with every possible condition, price, wear, comfort, country roads, etc. There is no group on the market which has competition for the Fisk Red-Top famed among small car users for the way it takes abuse under heavy loads and on bad roads.

Fisk Tires "arrived" years ago but they are still on the increase in popular favor to a most impressive degree. This makes it an advantage for the live dealer to stock Fisk and be prepared to meet the spring demand.

**The Fisk Tire Company, Inc.**  
Chicopee Falls, Mass.



"Indoor  
Advertising"



## How the Alemite Sales Cabinet Earns \$200 to \$1000 yearly, net profits on a *reduced* investment

Dollar for dollar, you can double or triple your sales of Alemite with the Alemite counter sales cabinet. We can cite you hundreds of dealers who are making yearly net profits of \$200 to \$1000—on an investment of less than \$100. Write us today.

This cabinet advertises Alemite *in* your store—on the spot—at the time your customer is ready to buy. It ties

you up with Alemite's tremendous magazine advertising. Keeps your stock conveniently arranged and easy to find. Enables you to equip any make or model car without a large stock investment. Faster turnover and bigger profits. So get this cabinet now. Write for particulars. No obligation.

THE BASSICK MANUFACTURING CO.  
2662 North Crawford Ave., Chicago, Ill.

A Bassick-Alemite Product

# ALEMITE

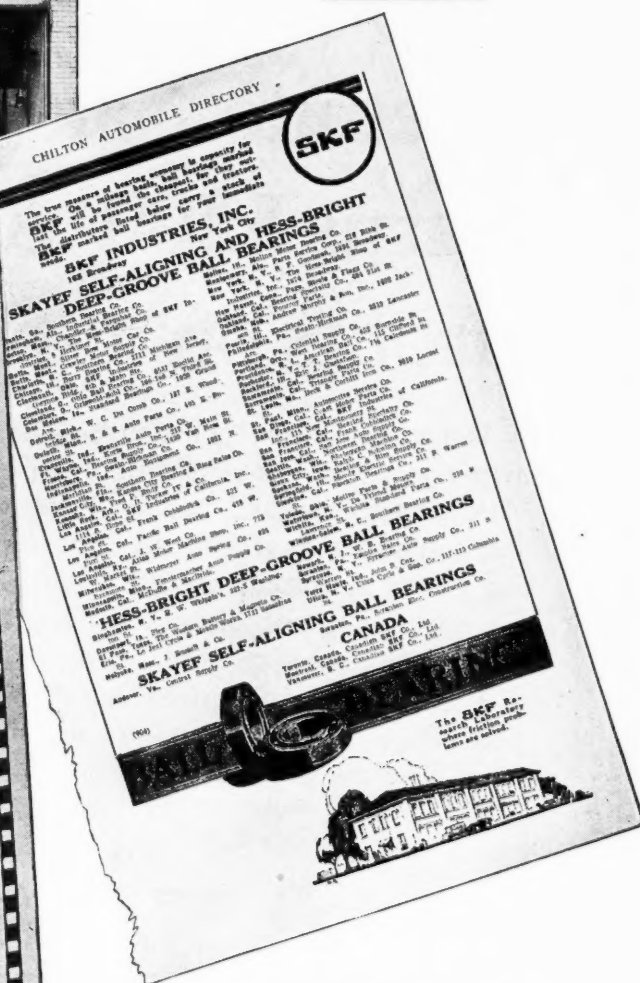
*High pressure lubricating system*

# Makes



For Specific Buying  
Information Consult  
Your

**Yellow  
Directory  
*First***



Here is the advertisement—a page listing distributors—to which Mr. Colt refers in his letter. Many other manufacturers insert complete buying information in Chilton Automobile Directory.



# It's Easy to Buy

Asserts Mr. Leonard P. Colt, Vice-President of Fred Allen Auto Supply Company, Chicago, Illinois.

He says: "Lots of times we use it for local information instead of the telephone book." Then he tells how he made a sale and strengthened his standing with an excellent customer.

But read Mr. Colt's interesting letter for yourself—

When you want to know immediately where a certain product or part can be found, remember Mr. Colt's experience—look in *Your Yellow Directory*.

You will find specific information about any article bought or made in the industry.

Listings are all under the noun, so that you know immediately the word to look for. Even though only the trade name is known, you can readily find the article, for trade names as well as manufacturers' names are listed.

Convenient cross heads help you find articles known by various names. For example, Windshield Visors are shown under Sun Shades and Sun Shields, as well as under Windshield Visors.

Specialties for Ford Cars are listed under separate headings—to save time and trouble.

Your *Yellow Directory* makes it easy to buy—use it oftener!

## Chilton Automobile Directory


"The Yellow Directory"

56th and Chestnut Sts.

Philadelphia

U. S. A.





**ALLEN**  
**RADIATOR COVERS**

**FRED ALLEN AUTO SUPPLY CO.**

**ALLEN**  
**TIRE COVERS**

**SPOTLIGHTS**  
**RIFLEX BUMPERS**  
**PROTECTOR STOP SIGNALS**

CHAINS  
MORRIS OIL  
DANN INSERT

TELEPHONE 2221  
CALUMET 2222  
2223

**AUTOMOBILE ACCESSORIES, TIRES**  
**GOODYEAR MAIN SERVICE STATION**  
1610 S. MICHIGAN AVE.

CHICAGO August 11th.,  
1924

Chilton Automobile Directory,  
Chestnut & 56th Sts.,  
Philadelphia, Pa.

Gentlemen:-

The "Chilton" Directory we received is undoubtedly the quickest and handiest means of finding information there is on the market. Lots of time we use it for local information instead of the telephone book.

Here is a typical incident. A mechanic, a regular customer of ours came hurrying into the store yesterday, wanted a Hess-Bright left front wheel bearing for a Buick car, said he had looked for a distributor in the telephone book but could not find any listed under "Hess-Bright".

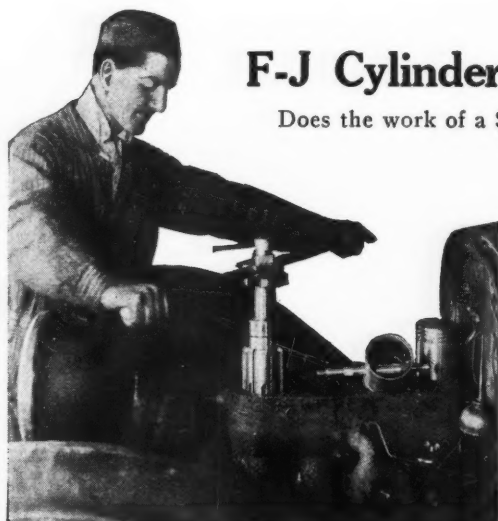
Referring to my "Yellow" Directory, I found they were not only listed but were advertising as well. Upon referring to their ad I found the exact information I wanted: A list of distributors. Locating Chicago I found they had a factory distributing station at 1140 West Washington Blvd., and had the bearing in his hands in thirty minutes.

The mechanic was very appreciative of the prompt service, and I had made the sale without substitution, as well as strengthening my standing with a very good customer.

We certainly appreciate the "Yellow" Directory, and thank you for remembering us with a copy.

Yours very truly,  
FRED ALLEN AUTO SUPPLY CO.  
By *Leonard P. Colt*  
(Vice President)

LPC:LEB

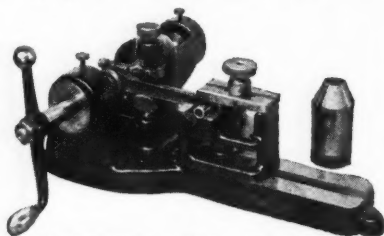


## F-J Cylinder Reamer

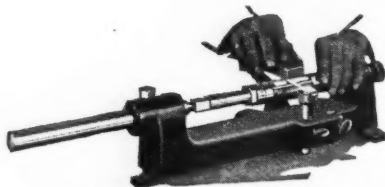
Does the work of a \$3,000 machine

### Pin Your Faith to the Foster-Johnson Family of Re-Conditioning Tools

and you will give service which makes and keeps satisfied customers. F-J equipment is the foundation of many a money-making service station. Write for literature and ask for the F-J Station Manual — shows how to get bigger business at bigger profits.

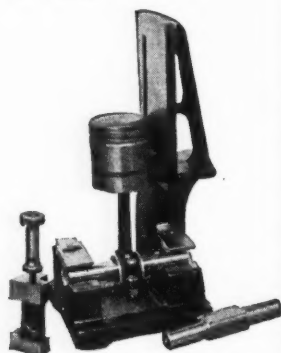


CONNECTING ROD RE-BORING FIXTURE



REAMER SHARPENER  
For Servicing Reamers in the Shop.

F-J Cylinder Reamer  
F-J Cylinder Hone  
F-J Reamer Sharpener  
F-J Connecting Rod Re-Boring Fixture  
F-J Piston Aligner  
F-J Connecting Rod Straightening Vise  
Kylin General Purpose Reamers.



PISTON ALIGNER  
A Precision Tool

**FOSTER-JOHNSON REAMER CO.**

1318 Beardsley Ave.

ELKHART

INDIANA

## "WHITNEY" SILENT HIGH MILEAGE CHAINS

### NO ELONGATION

The superior construction of a "WHITNEY SILENT HIGH MILEAGE CHAIN" assures the car owner of longer wear than is possible with any other chain. They frequently outlast the car and more than 150,000 miles is not unusual.

*Always replace with a "WHITNEY"*

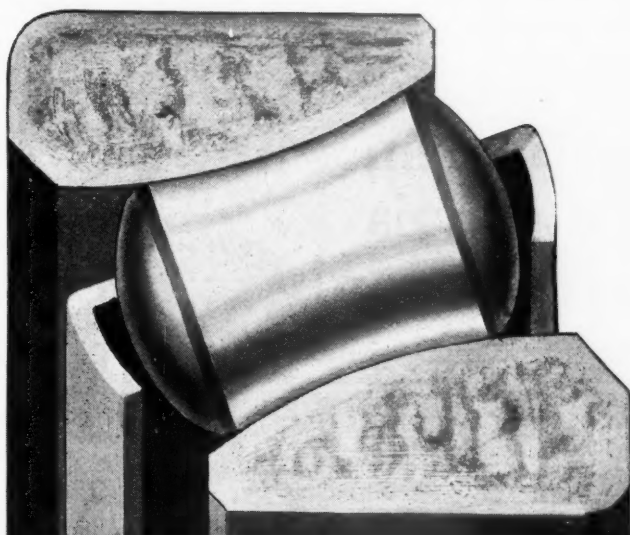
*Authorized distributors listed below.*

|  |   |
|--|---|
| Alabama—Birmingham<br>Birmingham El. Batt. Co.<br>Av. B. and 21st St.    | Nebraska—Omaha<br>Auto Elec. & Radio Corp.<br>2813 Harney St.                   |
| Arkansas—Little Rock<br>Crow-Burlingame Co.                              | New York—New York City<br>L. C. Biglow & Co., Inc.<br>243 West 55th St.         |
| California—San Francisco<br>A. H. Coates Co.<br>615 Howard St.           | New York—Buffalo<br>Roth & Zillig, Inc.<br>1063 Main St.                        |
| Colorado—Denver<br>Auto Elec. & Appl. Co.<br>W. 13th Ave., Acoma St.     | New York—Rochester<br>Sidney B. Roby Co.<br>208 South Ave.                      |
| Georgia—Atlanta<br>Alexander-Seewald Co.<br>81 N. Pryor St.              | New York—Syracuse<br>Syracuse Auto Supply Corp.<br>311 So. Warren St.           |
| Indiana—Indianapolis<br>Gibson Company                                   | Ohio—Akron<br>The Hardware & Supply Co.<br>475-535 South High St.               |
| Iowa—Des Moines<br>Brackett Co.<br>545 Fifth St.                         | Ohio—Cincinnati<br>Auto. Bear. & Equip. Co.<br>205-207 East 8th St.             |
| Kansas—Wichita<br>E. S. Cowie Electric Co.                               | Ohio—Cleveland<br>Auto. Bear. & Equip. Co.<br>7823 Carnegie Ave.                |
| Louisiana—Monroe<br>Monroe Auto Supply Co.                               | Ohio—Toledo<br>Hawley Sales Co.<br>624 Jefferson Ave.                           |
| Maine—Portland<br>Mank & Gray, Inc.<br>743 Congress St.                  | Oklahoma—Oklahoma City<br>Harrison Smith Co.<br>711 No. Broadway                |
| Maryland—Baltimore<br>J. R. Hunt & Co.<br>Calvert & Saratoga Sts.        | Pennsylvania—Altoona<br>Altoona Auto Supply Co.<br>1110 15th St.                |
| Massachusetts—Boston<br>George C. Steil<br>727-A Commonwealth Ave.       | Pennsylvania—Philadelphia<br>Auto Equip. & Ser. Co., Inc.<br>1421 No. Broad St. |
| Massachusetts—Springfield<br>E. B. Atmus Co.<br>113 Chestnut St.         | Pennsylvania—Pittsburgh<br>Pittsburgh Auto Equip. Co.<br>5808-10 Baum Blvd.     |
| Michigan—Detroit<br>Auto Elec. & Ser. Corp.<br>91 Selden Ave.            | Tennessee—Memphis<br>Mills-Morris Co.<br>372 So. Main St.                       |
| Minnesota—Minneapolis<br>Reinhard Bros. Co., Inc.                        | Texas—Dallas<br>Harrison Smith Co.<br>2018 Jackson St.                          |
| Missouri—Kansas City<br>E. S. Cowie Electric Co.<br>1818 McGee St.       | Washington—Seattle<br>A. H. Coates Co.<br>1115 East Union St.                   |
| Missouri—St. Louis<br>S. G. Hoffman Mag. Co.<br>3874 Washington Blvd.    | Wisconsin—Milwaukee<br>Lemke Electric Co.<br>505 Cedar St.                      |
| Missouri—Springfield<br>Ozark Motor & Supply Co.<br>308 S. Jefferson St. |   |

*These Distributors make it easier for you to use  
"WHITNEY SILENT HIGH MILEAGE CHAINS"  
on all replacements*

**THE WHITNEY MFG. CO.**  
HARTFORD, Connecticut





## SHAFER

### Self-Aligning ROLLER BEARING

PAT. & PATS. PENDING

Dear Sirs:

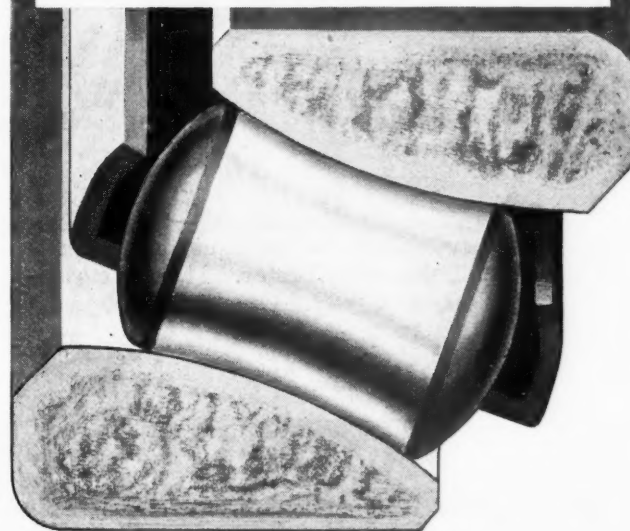
I suppose you hear this story every day but nevertheless I take pleasure in telling you that the Shafer Bearings on the front wheels of my Model R Hup have gone 30,000 miles with no attention except greasing and the last time I lubricated them I could not detect the least sign of wear.

I am more than pleased.

Sincerely yours,  
F.S. Blackinton, D.D.S.  
Los Angeles, Calif.

*Furnished in Interchangeable Sizes*

**SHAHER BEARING CORPORATION**  
6501 WEST GRAND AVENUE  
CHICAGO, ILL.



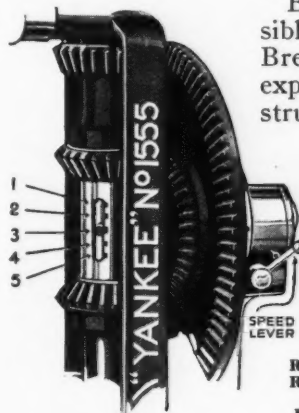
Drilling out cylinder head bolt close to cowl—  
an awkward job made easy by "Yankee"  
DOUBLE Ratchet.

## Tight against the cowl yet he drills easily

He doesn't need space to revolve crank of "Yankee" Ratchet Breast Drill.

When set on DOUBLE Ratchet any slight movement of crank back and forth causes drill to cut continuously.

By doing the otherwise impossible jobs, a "Yankee" Ratchet Breast Drill saves the time and expense of taking down construction.



### "YANKEE" Ratchet Breast Drill No. 1555

Five ratchet adjustments. Two speeds. 3-jaw chuck holds round shank drills up to 1/2 in.

No. 555. 2-jaw chuck holds both rounds and squares up to 1/2 in.

#### Some other "Yankee" Tools

Ratchet Hand Drills    Ratchet Bench Drills  
Ratchet Chain Drills    Ratchet Screw-drivers

Dealers everywhere sell "Yankee" Tools

#### Five Ratchet Adjustments

1. Plain Drill
2. Left-hand Ratchet
3. Right-hand Ratchet
4. DOUBLE Ratchet
5. Gears Locked

#### Free—to you

Interesting book illustrating and describing all "Yankee" Tools. If you like unusual tools, you'll want a copy.



**NORTH BROS. MFG. CO.,**  
Philadelphia, U. S. A.

# "YANKEE" TOOLS

*Make Better mechanics*

## GF Allsteel

The Complete Line of Office Equipment

### Unette and Wydesteel Filing Units

**Utility**—Units for every size record grouped in most convenient arrangement.

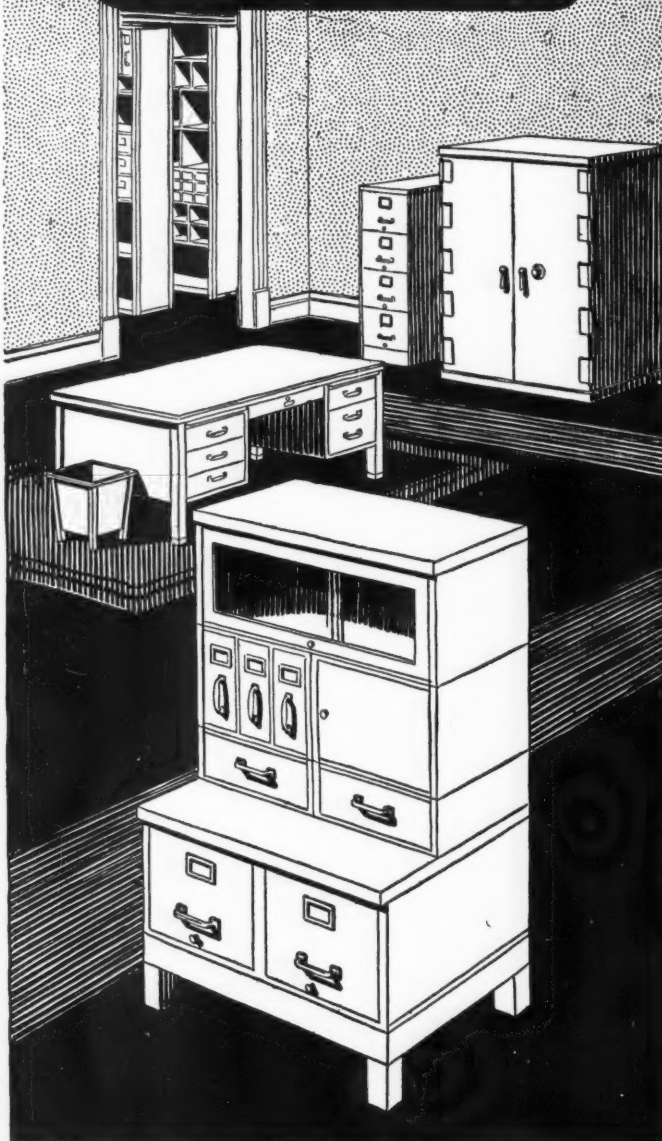
**Flexibility**—Units re-grouped or expanded at will.

**Strength**—Simple interlocking feature makes all combinations rigid units.

**Appearance**—Rich, baked-on enamel, olive green or grained.

**Permanent**—Welded steel construction and lasting finish make permanent investment.

*Shelving, Files, Desks, Transfer Cases, Safes, Counter-heights, Sectional Cases, Accessories and Supplies*  
**THE GENERAL FIREPROOFING CO.**  
 Youngstown, O. *Dealers Everywhere*



—but now,  
gentlemen,  
end play is  
easy to stop!

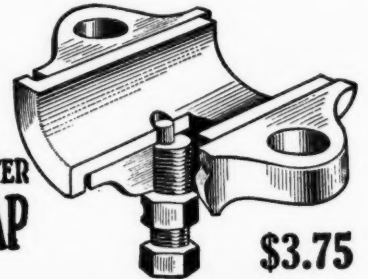


That most expensive and troublesome part of correcting Ford crankshaft end play—taking out the motor—is done away with entirely by the C-A ADJUSTABLE BEARING. Simply drop the oil pan to install it. End play will be twice as long developing but when it finally does, all you need to do is drop the oil pan again and adjust it. Eliminates all the evils of end play: dragging clutch, faulty ignition, worn wrist pins, scored cylinders, chattering bands, etc.

ADJUSTABLE BEARING  
COMPANY, INC.

Dept. 401  
BRAZIL, INDIANA

**CA** ADJUSTABLE CENTER  
BEARING CAP



\$3.75

**SAFETY** **not** **TESTER**

**BATTERY** **"Break"** **FIRST**

Price **\$100** east and worth it!  
of the rockies

EDELMANN & CO. CHICAGO

Every battery should be safeguarded with a BREAK-NOT Battery Tester. It is accurate, durable and easy to read. Over 3,000,000 users will verify this fact.

Write for other EDELMANN products in constant demand.



MADE BY  
**E. EDELMANN & CO.**  
2332 LOGAN BLVD. CHICAGO ILLINOIS



# WATERVLiet

## SPIRAL EXPANSION ALIGNING REAMER

*For Piston Pin  
Bushings on All  
Cars and Trucks*

## Absolute Precision

**H**ERE are a few reasons that account for the high degree of mechanical exactness incorporated in every Watervliet Reamer. Selected Tungsten Steel is specially heat treated in electric furnaces. Careful machining follows. Hand stoning puts the bite into keen cutting edges. Rigid factory tests assure dependable performance.

The finished reamer is fit for a master craftsman. Get a Watervliet and improve the quality, speed and accuracy of your work.

*Spiral flutes expand accurately for  
oversize work*

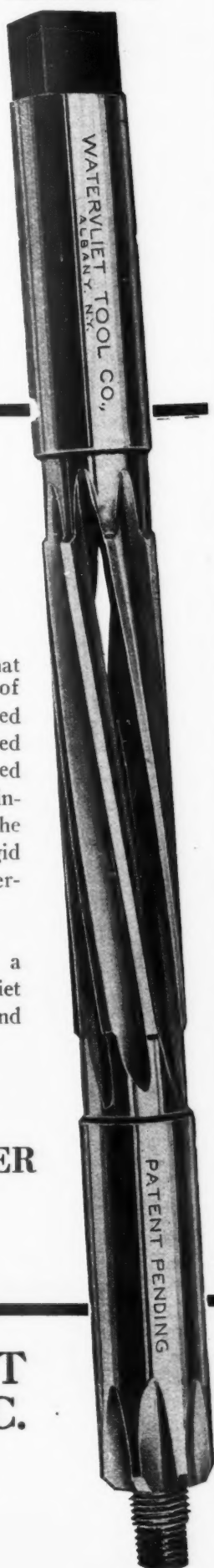
## WILL NOT CHATTER

ASK YOUR JOBBER  
OR WRITE FOR  
LITERATURE

## WATERVLiet TOOL CO., INC.

1037 Broadway  
ALBANY, N. Y.

New York—17 W. 60th St.  
Chicago—538 S. Clark St.  
San Francisco—661 Turk St.



## STOP OIL LEAKS



## PUT KEY GRAPHITE PASTE ON ALL GASKETS

Save oil and have a cleaner car by putting Key Graphite Paste on the three Transmission case gaskets on the Ford.

Also on the cylinder head gasket.

It seals tight but does not stick. Parts may be disassembled and gaskets used again.

There are a hundred and one uses for KEY in car service.

Prevents corrosion on battery terminals. Lubricates springs. Seals hose connections, etc.

No garage or car owner should be without it.

Correspondence invited with jobbers.



*The Handy Can*

## KEY BOILER EQUIPMENT CO.

27TH AND McCASLAND AVE.  
EAST ST. LOUIS, ILL.

## Sample—FREE

Key Boiler Equipment Co.,  
27th and McCasland Ave., East St. Louis, Ill.

Please send me without charge or obligation a sample of Key Graphite Paste.

Name.....

Firm.....

Address.....

Jobber's Name.....

M-A-12-18



## Sell Flatlite as a reflector or as a complete headlamp

Replacing with Flatlite Headlamps not only provides good lamps but light itself that is legal in all states because it is powerful without glare.

You can also sell the Flatlite Reflector for installation in any standard headlamp. The Flatlite Reflector will make it a safe light for night driving.

Flatlite is fast becoming the national headlight. The second million is now being sold. Dealers and jobbers everywhere are reporting remarkable success. We have their unsolicited letters and can show you this proof on the popularity of Flatlight Headlamps and Flatlite Reflectors.

Write today for our sales plan. We have some good territory still open.



The American Flatlite Company  
Department A

Reading Road at Dandridge Street, Cincinnati, Ohio

# Flatlite

*Makes Window Glass a Legal Lens*

Victor  
No. 47-G  
'Gloworm'  
Parking  
Lamp

The No. 47 "Fire-fly" is similar without the side jewel.



Furnished  
complete  
with a  
switch  
and wire  
ready to  
install



Victor engineers study the light and the condition under which it is to be used before producing the lamp. That is why Victor products give lasting service and satisfaction.

The "Gloworm" is a notable example. It is a one-piece casting for strength. It is fitted with imported cut jewels which intensify the light and give a maximum efficiency to the current saving bulb. It is provided with a husky nut for mounting it on the fender. This nut holds the lamp rigidly in place and also acts as a protective housing for the wire.

The "Gloworm" is made and finished like a piece of jewelry. It is an attractive, inexpensive and serviceable fixture that has a reputation for quick turnover. Write today for details on this and other Victor Products.

THE CINCINNATI VICTOR CO.

714 Reading Road

Cincinnati, Ohio

## The Victor Line

# A P E X



## JOBBERS Catalog APEX in 1925

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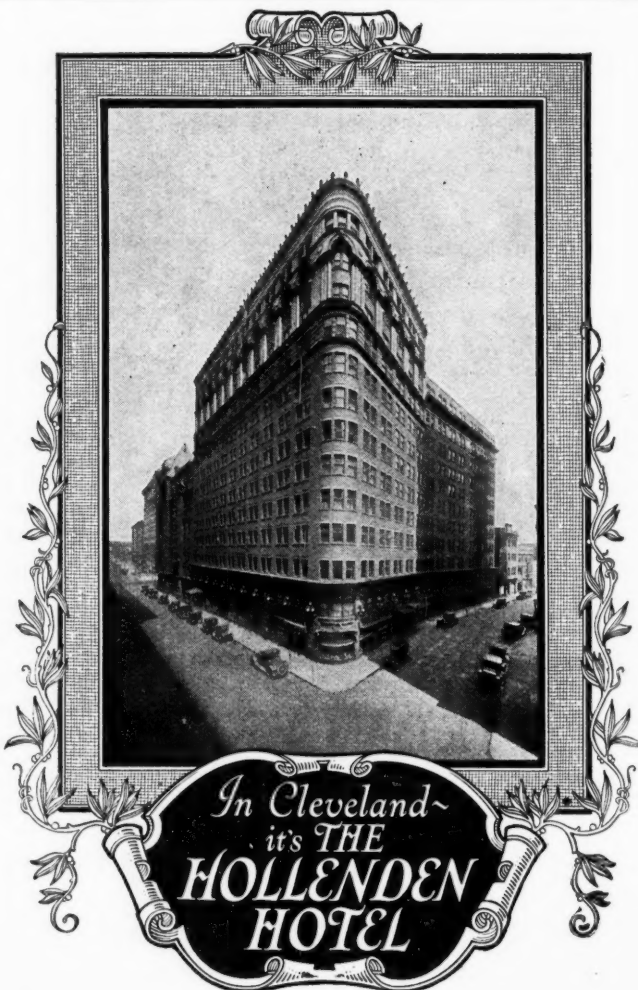
**THOMSON MFG. CO.**

Dept. C.

Peoria, Ill.

"If it isn't an APEX—it isn't an INNERING"

LIST, 20c EA.—ATTRACTIVE DISCOUNTS



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STAND**


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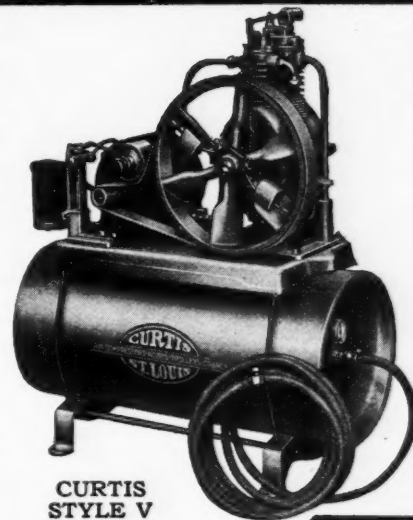
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**CURTIS  
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Two-stage Outfit,  
Sizes 3-4 to 2 H. P.  
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1854 <sup>71st</sup> ANNIVERSARY 1925

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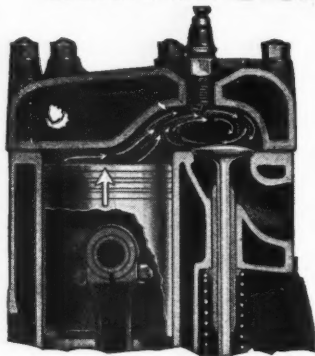
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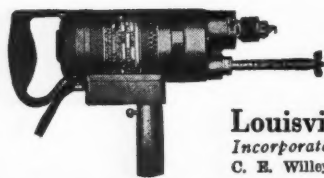
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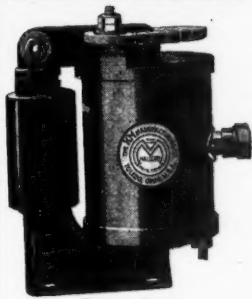
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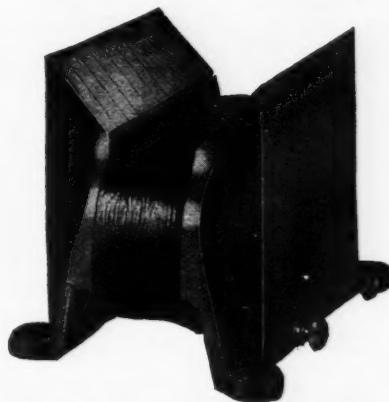
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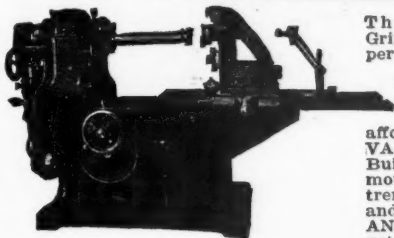
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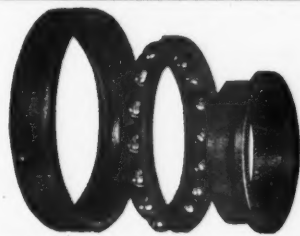
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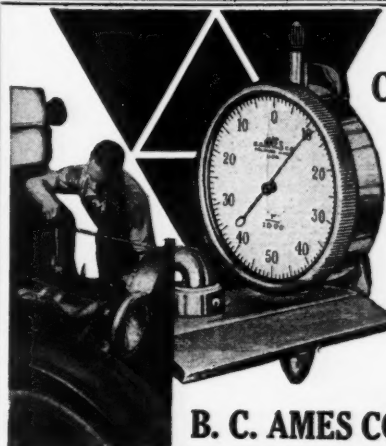


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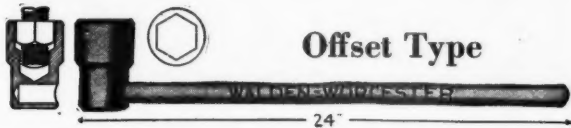
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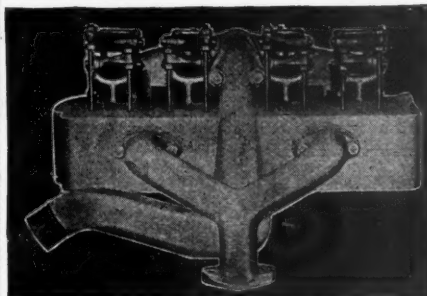
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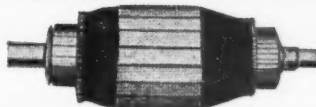
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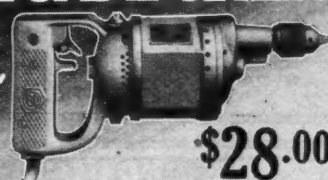
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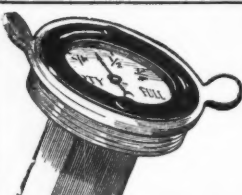
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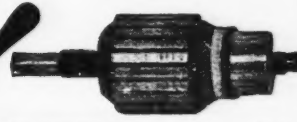
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\$30 per set of four

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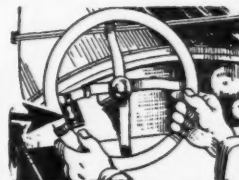
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**WALL PUMP & COMPRESSOR CO.**

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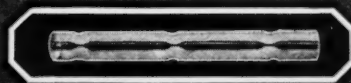
### Lowest Priced Method of Efficient Spring Lubrication

R & C Oiler comes in 30 ft. rolls. One roll will equip from 6-12 cars. Installed with pliers in few minutes. Real dealer opportunity. Good profits. Write. Exclusive distributors wanted.

**R. & C. MFG. CO.**  
 Parkersburg, W. Va.

### NESTER Acid-Core WIRE SOLDER

"REQUIRES ONLY HEAT"



SAMPLE FREE

**CHICAGO SOLDER CO.** 4701 Wrightwood Ave.

## Willys-Knight

and Overland cover a price range that fits 90% of the pocketbooks of all car buyers!

WILLYS-OVERLAND, INC., TOLEDO, OHIO  
Willys-Overland Sales Co. Ltd., Toronto, Canada

**"The Best-Equipped Shop Gets the Business"**



## Big money in this service

Dealers and shops make big money through the control of a franchise which entitles them to the exclusive use of the patented "KLEAN RITE" system of washing and polishing automobiles.

This system has turned a job into an impressive, highly profitable business.

Write for full particulars

**Klean-Rite Auto Laundry Company**  
1710 East 75th St. Chicago, Ill.



## Any Pump Shaft Leak Permanently Repaired

Conneaut Plastic Metallic Packing molds in fingers. Fit in stuffing box around shaft. Hardens into practically frictionless bearing. Can be "taken up" for adjustment. Remarkable results. \$1.65 in one pound cans. Get it at your jobber or write direct.

Conneaut Packing Co., Conneaut Ohio

Over 110,000,000

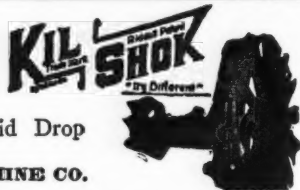
## TIMKEN Tapered ROLLER BEARINGS

Have Been Manufactured

## Pulls Car Over Rough Spots

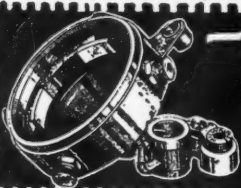
No friction—no springs—no oiling. For Fords—solid Drop Forging—\$24.00.

**YORK ELECTRIC & MACHINE CO.**  
York, Pa.



## MONOGRAM ORIGINAL SELF LOCKING RADIATOR CAP

GENERAL AUTOMOTIVE CORP., 600 W. Jackson Blvd., CHICAGO



## —Bakelite Case!

This famous roller-type timer is absolutely "short-proof". The only standard timer with Bakelite case

**MILWAUKEE  
TIMER for FORDS**

## For Dependable Air

Use a  
**FRANKLIN SUPER-SINGLE-STAGE AIR COMPRESSOR**  
**FRANKLIN**  
**AIR COMPRESSOR WORKS**  
2602 Main St. Norristown, Pa.



## BATTERY PLATES for WINTER

Pore-Blown Plates do the winter job better than any other plates, because they have greater capacity. They also have re-enforced grids and pulverized materials go into the paste. All battery parts. Write for catalogue.

**General Storage Battery Co.**  
2005 Locust St. St. Louis



## QUALITY—PROFIT—TURNOVER

**American  
Hammered  
Piston Rings**

**American Hammered Piston Ring Company**  
Baltimore, Maryland

## ALMOND "STRAIGHT LINE" DRILL CHUCKS

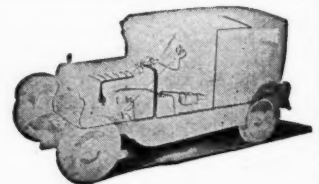
When buying Portable Electric Drills be sure to look for the distinctive ALMOND CHUCK, which may be easily identified by the "STRAIGHT LINE" milling on the chuck body.

Write for complete information regarding the new ALMOND "STRAIGHT LINE" CHUCKS.

**T. R. Almond Mfg. Co., Ashburnham, Mass., U. S. A.**

**Packard  
Cable**

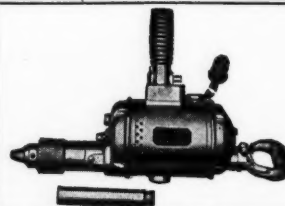
**The Packard Electric Co.**  
Warren, Ohio



## STONE TIRE CARRIER

No interference with tail light or tire covers. \$3.00 complete for s.s. rims; \$2.50 for Ford Clinchers—\$1.00 Ford lug type. At all dealers.

**THE STONE MANUFACTURING COMPANY**  
1502 S. Michigan Ave. Chicago  
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**The Cincinnati**  
Electric Drills Grinders Buffers

A tool for every purpose. Long service makes them cost the least.

**The Cincinnati Electrical Tool Co.**

1515 Freeman Ave., Cincinnati, O.

**Thirty-seven  
BRANCHES**  
**AHLBERG BEARING COMPANY**  
321 EAST TWENTY-NINTH STREET, CHICAGO ILLINOIS

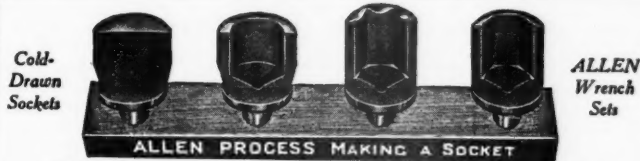


## Goodrich Cable

AUTOMOTIVE EQUIPMENT  
*Starting-Lighting-Buzzing*  
Formerly M.R.

Goodrich Cable is sold in lengths found to be the most popular with the average buyer—coils of 100 ft. packed in individual cartons. Both shop men and car owners like the clean 100 ft. package idea—and this leads to quick and profitable sales. Send for samples, prices and discounts.

THE GOODRICH-LENHART MFG. CO., Hamburg, Pa.



The Allen Manufacturing Company, Hartford, Conn.



For replacement in all makes of auto vehicles—  
**Thompson Silcrome Valves**  
*(they will not burn)*

**Thompson Products**  
Cleveland



## UNIVERSAL HOSE CLAMP

Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

UNIVERSAL INDUSTRIAL CORP.

Hackensack, N. J.

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AIR COMPRESSORS  
**FREE**

Write for the Book  
**"AIR PROFITS"**

describing many new uses for compressed air. Shows how to make an air compressor earn greater profits.  
**BRUNNER MFG. CO.**  
UTICA NEW YORK



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**WEAVER MANUFACTURING COMPANY**  
SPRINGFIELD  
ILLINOIS  
U.S.A.

Send for Catalog

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### HOUSE OF A MILLION AUTO PARTS

THE LARGEST STOCK OF NEW AND USED CAR AND TRUCK PARTS IN THE WORLD. WE HAVE EVERYTHING.

New and Used Motors, Gears, Axles, Bearings, Springs, Magneto's, Generators, Clutches, Starters, Universal Joints, Radiators, Cushions, Wheels (Wood, Disk, Wire), Carburetors, Piston Rings and Pins, etc.

Always mention model and serial number in order.

Write us. All inquiries answered promptly  
**DOUGLAS AUTO PARTS CO., INC.**  
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#### DOWMETAL PISTONS

Lighter, stronger, and longer wearing than aluminum or iron. Can be fitted with bronze bushings in the wrist pin holes same as in iron pistons. Dowmetal has no permanent growth. The expansion is little more than iron.

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SAVES 50% TO 75% ON ALL CARS

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316-18 NO. ILLINOIS ST. INDIANAPOLIS, IND.  
LARGEST CAR WRECKERS IN INDIANA

ANY PART  
for  
ANY CAR  
NEW  
or  
USED

Send for Catalogue  
**Cincinnati Auto Parts & Wrecking Co.**  
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CINCINNATI, OHIO  
Parts our middle name

**MITCHELL, COLUMBIA, LIBERTY, STEPHENS and PREMIER.** Parts for all models. Discount to the trade. Mitchell Co., 421 W. 55th St., New York.

ADDRESS: **FORD RIDEASY**, 223 Grand Ave., W. Detroit, Michigan. Absolutely kills the chatter shocks and irons out the rocking rebounds.

#### PARTS

### AUTO Save 50—90% 2000 Models PARTS

NEW AND USED GEARS, AXLES, BEARINGS, SPRINGS, MAGNETOS, GENERATORS, ETC. JOBBERS IN BANKRUPT AUTO SUPPLIES.

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Prompt service. Highest references. Established 1864.  
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Attorney-at-Law and Solicitor of Patents

**C. L. PARKER**

Formerly Member Examining Corps, United States Patent Office

American and foreign Patents secured. Searches made to determine patentability and validity. Patent suits conducted. Pamphlet of instruction sent upon request.  
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BOOKLET FREE HIGHEST REFERENCES  
PROMPTNESS ASSURED BEST RESULTS  
Send drawing or model for examination and report as to patentability

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Write for my free Guide Books "How to Obtain a Patent" and "Invention and Industry" and "Record of Invention" blank before disclosing inventions. Send model or sketch of your invention for instructions. Promptness assured. No charge for above information. **Clarence A. O'Brien**, Registered Patent Lawyer, 232-C Security Bank Building, directly across street from Patent Office, Washington, D. C.

#### HELP WANTED

**AUTOMOBILE TOOL SALESMEN**—We want high powered salesmen with real ability to sell a well established line of automobile wrenches to garage and repair shops, auto supply dealers, hardware stores and industrial. The line is nationally and favorably known and is the leader in its field. We pay liberal commission. State experience, lines sold, etc., in reply.  
ADDRESS **P. O. BOX 206, CHICAGO, ILL.**

#### HELP WANTED

**WANTED SALESMAN** for stamping and tools by an amply financed company. Plant located in central states. One who is able to assume responsibility of keeping plant filled with profitable business, for such an individual attractive proposition is offered. All correspondence held strictly confidential. Address Box 6204, care of MOTOR AGE, 5 S. Wabash Ave., Chicago, Ill.

**MEN WANTED** to sell Merchant's Anti-Skid Chain Tighteners. Very best on the market, and sells on sight. Extensive advertising behind this article. Very liberal profits. Particulars free. Send 30 cents to cover expense for sample. **Williams Auto Accessories**, 402-406 Gurney Bldg., Syracuse, New York.

#### SITUATIONS WANTED

**POSITION WANTED**—AS SERVICE MANAGER OR SHOP FOREMAN. FIFTEEN YEARS' EXPERIENCE IN SERVICE DEPARTMENT, LAST SIX WITH DODGE BROTHERS DEALER AS SERVICE MANAGER. ADDRESS **J. T. WILLIAMS, OWENSBORO, KY., CARE CAVIN BRODIE**.

#### AGENTS AND DISTRIBUTORS

**WANTED**—Distributors and agents for our Hot Spot Manifold Heater and Improved Foot Brakes for "Chevrolet." Full details on request. **Mosey & Mosey, Inc.**, 1418 Tenth Ave., Seattle, Wash.

#### BUSINESS OPPORTUNITIES

**FOR SALE**—Tire and Vulcanizing Store. Established, reputable high grade Vulcanizers to the trade. Having exceptional commercial accounts and growing store trade. Modern and up-to-date shop and complete stock of new and used Tires and Accessories. Also good income from lease on entire building making rent of corner store and stock room free. Will sell for fair market value of stock, machinery, etc., on any fair terms suitable to buyer. Cash, Time or Limited partnership. Other interests necessitate change. Experience unnecessary. Will teach purchaser. Investigate. No agents. Address Box 6209, care Motor Age, 5 S. Wabash Ave., Chicago, Ill.

#### PARTNER WANTED

**ESTABLISHED business.** Want partner with \$3,000 to help finance car agency. **Monroe Motors**, 2014 Welton St., Denver, Colorado.

#### RACING EQUIPMENT

**WANTED**—Dirt Track Racing Car or Motor. Address Box 6206, care MOTOR AGE, 5 So. Wabash Ave., Chicago, Illinois.

## Be ready for any spring job



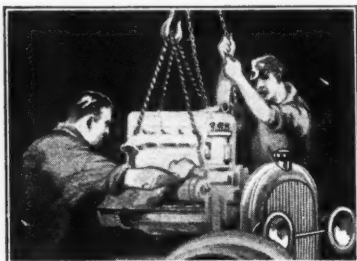
**PECK**  
Garage  
Assortment No. 2  
**\$3<sup>50</sup>**  
LIST

Peck's assortment No. 2 combines a wide variety of springs ready for the job.

A well made, sturdy box arranged in compartments means convenience, time saved, money saved. It is an efficient worker in the shop and besides—it earns a good profit. Generous quantities of the most used sizes. A spring when you need it—right at hand.

Give your Jobber's name when ordering to insure discount.

**The Peck Spring Co.**  
Plainville, Conn.



### Wouldn't It PAY to Know Him?

Not-over-a-day-away from your shop is one of our over 550 Milwaukee Distributors carrying a complete line of Milwaukee Bearings in sizes most in demand in your territory.

With your request for name of your nearest Milwaukee Distributor we furnish FREE copy of our nationally-used new, quick-reference edition of Bearing Guide. Lists practically every make of car, truck and tractor, with bearing stock numbers of each.

He is getting the business because he is a vital part of the fastest, most complete bearing service in the country. He's on the job the moment he gets your order—has what you want and gets it in the mails in a jiffy. You can't "sell" your ability to deliver any job on time any easier than by giving unexpected service on one of the meanest BIG jobs. Prove this by ordering Milwaukee Bearings next time you're in a pinch.

**MILWAUKEE DIE CASTING COMPANY,**  
Dept. F-12  
Milwaukee, Wis.

**MILWAUKEE** Not Over a Day Away **BEARINGS**

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## Now—You Can Get Replacement Bearings Quickly!

FOR FORD PARTS, NUMBERS

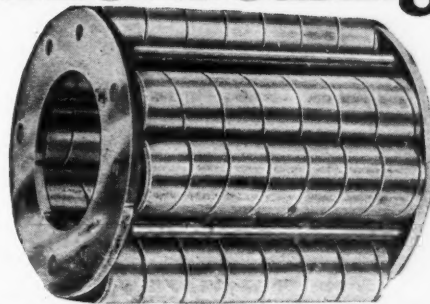
|      |      |
|------|------|
| 2508 | 2587 |
| 1019 | 2593 |
| 1046 | 2596 |

GET them from your jobber! He can give you almost instant service on Little Giant Roller Bearings. We deliver to jobbers the SAME DAY order is received.

Little Giants are the very finest replacement bearings. They are built to exact sizes, have extra heavy ribs for strength and are made of the best bearing materials.

ROLLER BEARING CO. OF AMERICA  
Frolinghuysen Ave. & Hunter St., Newark, N. J.  
We make bearings for everything that rolls

## LITTLE GIANT Roller Bearings



## MORRISON AUTOMATIC DOUBLE RANGE Worm Drive JACKS



Made in 9 sizes for all service requirements. Special model for Balloon Tires.

### Can't slip or tilt

The flexible steel "Sure Hold" cap prevents dangerous slipping. The long folding handle (36" to 72") operates from standing position.

High class construction throughout. Vanadium steel gears and standard make bearings.

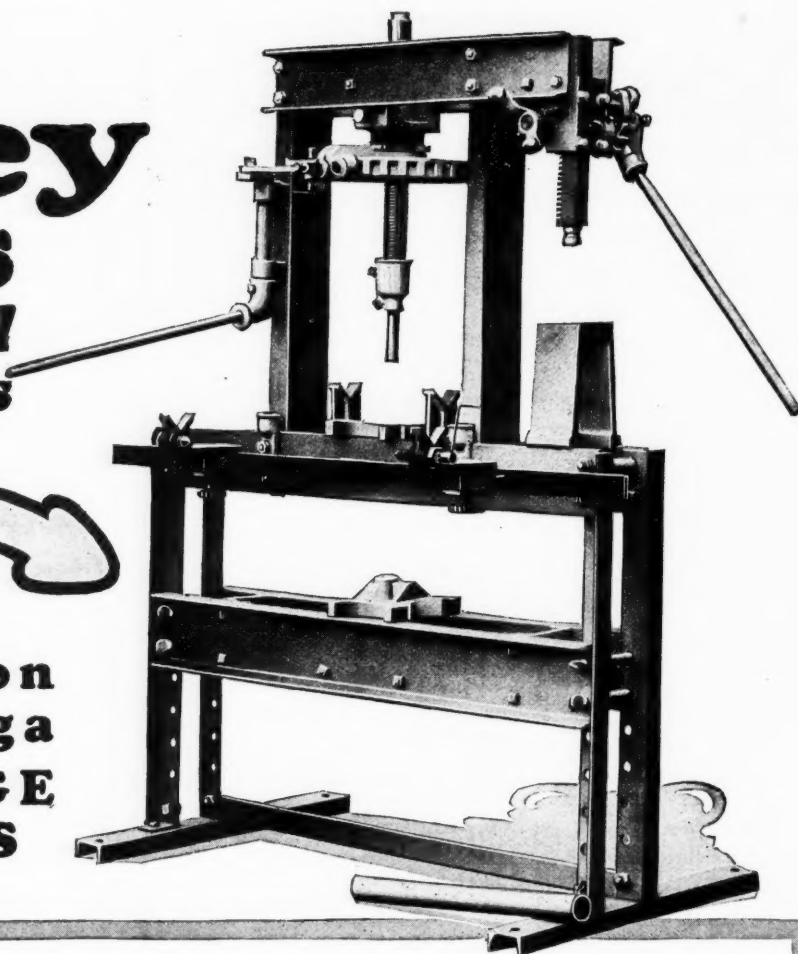
Write for sample for test.

**Woods Engineering Co.**  
Alliance, Ohio

This Jack has been furnished as standard equipment on high class passenger cars, trucks, buses and fire engines for the past 4 years.

# Get a Manley Press

*It meets all  
requirements*



## Hints on Selecting a GARAGE PRESS

1. Your own judgment of mechanical construction will enable you to form a good opinion as to strength. If you buy a press rated at 30 tons capacity you don't want to feel that your press will break down if you happen to apply thirty-three tons pressure on some hard job. Get the "huskiest" 30-ton press you can buy.

2. There are times when straight pressure will not do the job. It is preferable to select a press which has the top end of the screw exposed. This enables you to jar a stubborn part loose by a hammer blow on the exposed end of the screw. In extreme cases you can thus get the effect of approximately 100 tons. Of course, the press must be designed to take such jolts.

3. Be sure that the hand levers are in a natural position to enable you to exert maximum pressure with minimum effort. Be sure the levers are arranged so you can use them

conveniently and at the same time keep your eyes on the work.

4. A Garage Press should be arranged for a quick change of speeds and leverages, so you can handle either light or very heavy work without delay changing leverages.

5. Get a press with a wide clearance between the vertical uprights.

6. A press with a double table is to be preferred to one on which a single table must be adjusted to different heights. Long and short noses should be provided with the press for the same reason.

7. A heavy garage press on which a high speed rack and pinion arbor press is mounted enables two men to do press work at the same time.

8. Always buy a press which is well known. Goods manufactured and guaranteed by big reliable concerns are always safest.

# Get a Manley

You can secure from your own jobber. Write for special bulletin.

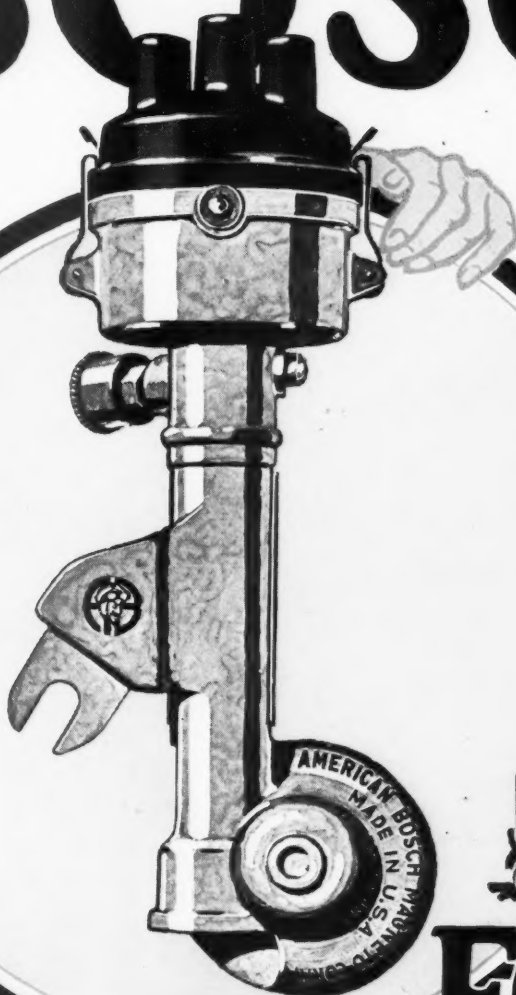
**MANLEY MFG. CO., York, Pa.**



The

# BOSCH

## Ignition System



TYPE  
600



for

# FORDS

Only  
**\$12 75**  
in Canada \$17 50

If you want to see a real enthusiast, get in touch with any Ford owner using Bosch Type 600 Ignition.

He's so pleased at the wonderful improvement in his engine that he is anxious to tell everybody about it—

He shows them how smoothly the engine runs—how easily she starts—how quickly she accelerates—how powerful she is on the hills.

He's the best salesman in the world—and he works for

nothing! Start a lot of Ford owners working for you by selling them Type 600 Ignition Systems.

Wire for sales plan and a sample outfit C. O. D. Get started TODAY.

**AMERICAN BOSCH MAGNETO CORPORATION**

Main Office and Works: Springfield, Mass.

Branches: New York Chicago Detroit San Francisco

DEALERS: Big advantages open to live dealers who can become Bosch Sales Agents and sell the Bosch Long Line of Automotive Necessities.



**Bosch Shock Absorber**

A new scientific device that controls car springs perfectly and provides true riding comfort at low cost. Prices per pair: For Fords, \$10.00. Medium Cars, \$15.00. Heavy Cars, \$20.00.



**Bosch Electric Windshield Wiper**

An absolutely reliable, automatic cleaner that is operated electrically. Not affected by engine speeds. Puts no burden on the battery. Price, \$9.50.



**Bosch Red Spark Plug**

The big, sure-firing, gas-tight plug with the unbreakable insulator and the real nickel electrodes. Get the genuine—it's red! Regular sizes, \$1.00. Ford size, 75c.



# REPUBLIC TRUCKS

**L**OWER initial outlay first puts Republic trucks into so many fleets. Lower operating costs soon make Republic the fleet standard. Longer life keeps all Republics on the job, until now Republic has more trucks in use than any other exclusive truck builder. Such good trucks, *even greatly bettered*, and powerfully backed, make money for owners—and therefore for dealers.

REPUBLIC MOTOR TRUCK CO., INC.  
Alma, Michigan  
More Trucks in Use than any other  
Exclusive Truck Builder

Yellow



Chassis